

Next Steps in Parking Management

2010 MDI Downtown Parking Workshop



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Lexington, MA

April 28, 2010

Nelson | Nygaard
consulting associates

Workshop Agenda

Introductions

Parking Reform 101

Coffee Break

Conducting a Parking Study

Zoning Strategies

Market Realities

Lunch

Regulatory Strategies

Community Benefits

Parking Technology

Tour of Lexington Parking

Who Am I?



National downtown parking experience

- San Francisco
- Washington DC
- New York City
- Philadelphia
- New Orleans
- Seattle
- San Diego
- Denver
- Walnut Creek
- Mammoth Lakes
- Angwin
- Ithaca
- Ann Arbor
- Charlotte
- Eugene
- Trenton

Local parking experience

– Belmont Parking Workshops & Reverse Angle Study

- Create availability
- Cooperate with private landowners
- Moderate resident's fears



– Reading Parking Plan

- Comprehensive utilization & turnover study
- Manage employee parking
- Avoid an expensive garage



Local parking experience

- Department of Housing and Economic Development – Needham Shared Parking
 - Economic model to support leasing of private lots through in-lieu fees, permits, meters
 - Bringing competing landowners together



- Orange Parking Plan
 - Utilization assessment
 - Shared parking and on-street strategies to accommodate a new redevelopment without dedicated parking



Local parking experience

– Salem Comprehensive Parking Plan

- Full performance based restructuring of downtown parking regulations



– Others

- Winchester
- Haverhill
- Nantucket



Attendee	Reason for Participating
Arlington Transportation Advisory Committee	Arlington is reviewing the potential for paid on-street parking in the CBD
Berkshire Regional Planning Commission	Smart Parking Strategies for small downtowns working on revitalization; appropriate distances for off-site parking; current cost of surface vs. structure parking; how to encourage parking once; financing municipal parking in MA
Brockton Parking Authority	Financing for acquiring space and infrastructure repairs; enforcement of parking laws and allocation of parking violation revenues; planning central parking facilities to free up space for downtown development
BSC Group	To learn?
City of Cambridge	What new innovations are happening in parking management nationally and whether any local municipalities have implemented them
City of Holyoke	Off-site parking requirements, with the establishment of a method or fund to aid the city in maintenance and potential expansion of the existing parking system, in light of potential significant revitalization efforts
City of Newton	To learn?
City of Northampton	To learn?
City of Westfield	To learn?
City of Woburn	Woburn is reviewing management of its downtown parking spaces with regard to supply, demand, and including type of demand and enforcement of regulations
City of Worcester	Pros & Cons of Leasing a municipal parking system

Attendee	Reason for Participating
Community Circle	I am a consultant to municipalities which have a variety of parking concerns and issues.
Community Investment Associates	Using a paystation vs. meters; Seasonal shuttles; Parking requirements level by use in zoning is also of general interest
Heart of Taunton/Taunton Parking Commission	To improve parking in downtown Taunton and learn more about parking management
Historic Preservation Consulting	Adaptive reuse of historic buildings and handling car accommodation without paving entire sites
Lexington Center Committee	With a finite parking supply, how do you meet the needs of your existing businesses and attract new businesses?
Littleton MBTA Advisory Committee	Learn how to provide appropriate parking services (e.g. first come, first served daily parking; short-term parking; and facility for shuttle van passenger drop-off from satellite parking lot) to accompany a new commuter rail (MBTA) station
MassDevelopment	Connecting expanded downtown areas to shared parking areas- what are preferred maximum distances? Are there good ways to encourage use of municipal lots vs. the limited on-street parking?
Metropolitan Area Planning Council	To learn?
Montachusett Regional Planning Commission	To learn?
Newton Villages	To learn?
Propark, Inc.	To learn?
Town of Arlington	How does metered parking fit into parking management?
Town of Ayer	To learn?

Attendee	Reason for Participating
Town of Barnstable	How to best utilize the parking we have and plan for parking as needed in the future
Town of Braintree	To learn?
Town of Concord	To learn?
Town of Danvers	Always looking to improve zoning bylaw and town management practices to strengthen downtown and avoid unnecessary parking requirements
Town of Duxbury	What is current BMP for size of spaces in the Commonwealth? What are BMPs for two-way and one-way curb cuts? Are there BMPs for number of spaces required per type of use in Commonwealth? Hoping to get a clear understanding of what BMPs are amongst towns in Commonwealth and what the pitfalls are of each.
Town of Georgetown	Downtown revitalization and using 40 R to encourage mixed-use development
Town of Groton	Provide factors that facilitate shopping locally
Town of Hopkinton	Downtown parking and shared parking strategies are of interest
Town of Hudson	Our Historic Downtown is suffering a vacancy problem and parking shortage. We have street parking with some small lots behind buildings and recently applied for CDBG funds for a parking study to construct a garage, or perhaps, smaller lots.
Town of Lexington	Perceived versus actual parking shortage; Center Parking, TDM, Market-based parking pricing, cashout programs
Town of Middleborough	To learn?

Attendee	Reason for Participating
Town of Nantucket	Downtown Nantucket has limited parking availability, which creates parking management and traffic congestion issues. We are considering the construction of a parking garage as part of a brownfield redevelopment site that is located within the downtown.
Town of Reading	Reading is mainly concerned with parking in the downtown area. We have had several new businesses moving into town and have lost others because of lack of parking.
Town of Rockport	To learn?
Town of Walpole	Achieving balance between demand for parking for businesses and the MBTA commuter rail patrons, which serves the town's ongoing downtown revitalization and economic development efforts
Town of Weymouth	To learn?
Town of Winchester	To learn?
Vine Associates, Inc.	To learn more
Waterfield Design Group	To learn?
Watertown Dept. of Community Development & Planning	Perceived need for parking to support economic development, winter parking bans, how to effectively implement innovative solutions
Westfield Business Improvement District, Inc.	What creative initiatives are happening in other communities with municipal parking!

Session 1

THE HIGH COST OF PARKING

All transportation systems have three basic elements:

Vehicles

Trains

Airplanes

Ships

Cars

Rights of way

Tracks

Sky

Oceans

Roads

Terminal capacity

Stations

Airports

Seaports

Parking spaces

Automobile travel is unusual in two ways:

1. It requires enormous terminal capacity (several parking spaces per car).
2. Drivers rarely pay for this terminal capacity, because parking is free for 99 percent of automobile trips in the US.
3. The cost of parking has been shifted out of the transportation sector and into the prices for everything else.

Who pays for free parking?

Everyone but the motorist.

TABLE 7-1
ANNUAL CAPITAL AND OPERATING COST
OF OFF-STREET PARKING
(\$billions per year in 1990-1991)

	<u>Low</u>	<u>High</u>
Bundled residential parking	\$15	\$41
Bundled non-residential parking	\$49	\$162
Municipal and institutional parking	\$12	\$20
Priced parking	<u>\$3</u>	<u>\$3</u>
Total cost of parking	\$79	\$226
Total parking subsidy	\$76	\$223
Priced parking as % of total parking	4%	1%

Source (Delucchi 1997, Tables 1-5, 1-6, and 1-7)

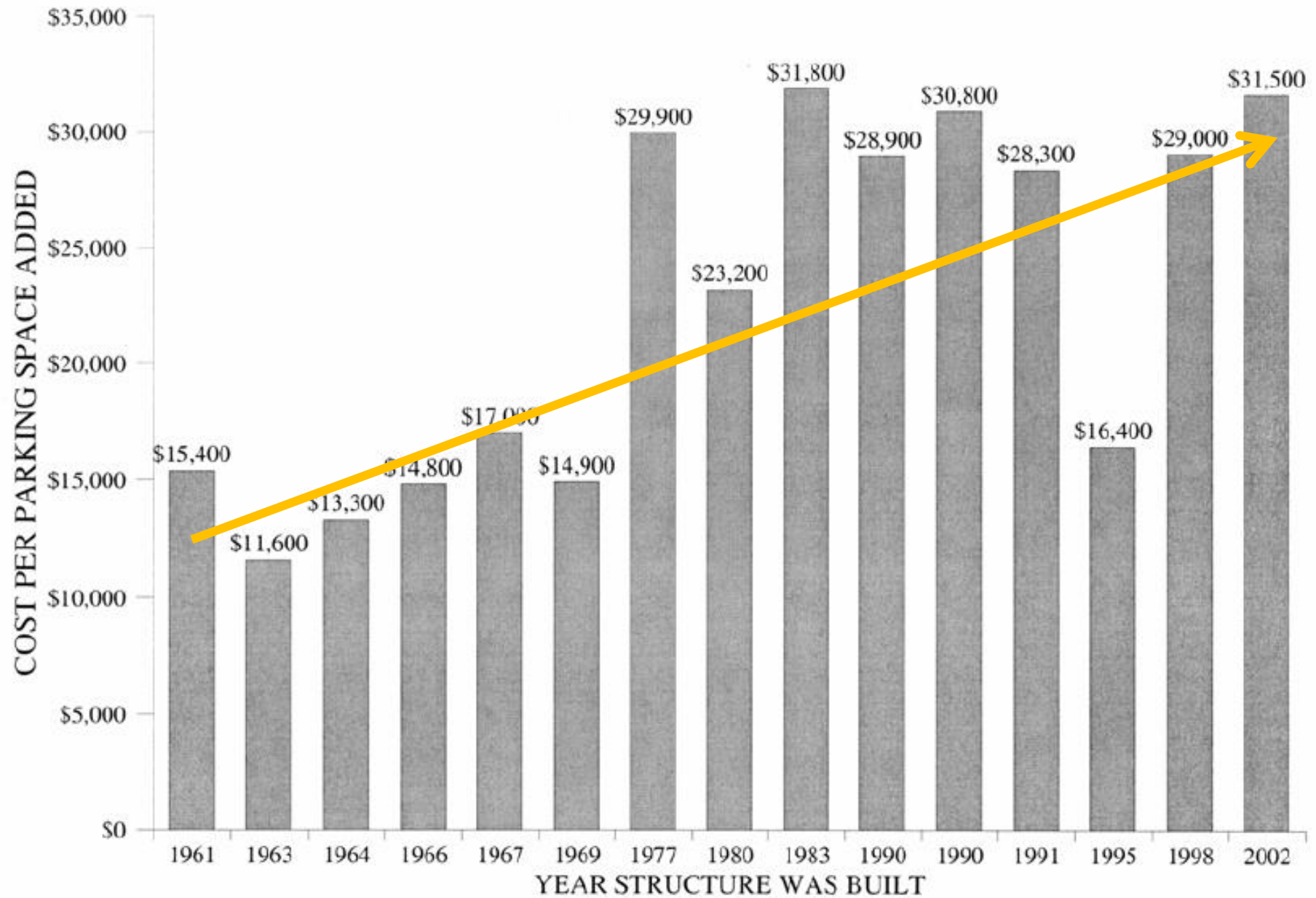
In 2002, the total subsidy for off-street parking was between \$135 billion and \$386 billion.

In 2002, the federal government spent \$231 billion for Medicare, and \$349 billion for national defense.

Report	\$/gallon gas or diesel	annual cost in billions
Ketcham & Komanoff	5.53	730
Litman	7.08	935
MacKenzie, Dower & Chen	3.03	400
Moffet & Miller	2.86 - 5.00	378 - 660
Vorhees	4.78	631
Office of Technology Assessment	3.39 - 6.81	447 - 899
OTA *	11.17 - 16.11	1,475 - 2,127
Delucchi	3.13 - 7.55	413 - 997
* includes non-monetary personal costs (owner accidents & travel time)		

- Sources of Subsidies**
1. Police, fire, ambulance; road construction & maintenance; other local government - paid for with taxes.
 2. Property taxes lost from land cleared for freeways
 3. Parking - free or cheaper parking is paid for with other taxes, or more expensive goods or services.
 4. Air, water, land pollution - adds to medical expenses, loss of species and cleanup costs.
 5. Noise, vibration damage to structures - adds to medical expenses and repair costs.
 6. Global warming - adds to medical expenses, loss of species and other costs.
 7. Petroleum supply line policing, security, petroleum production subsidies - increases taxes for defense.
 8. Trade deficit, infrastructure deficit - increases costs of goods.
 9. Sprawl, loss of transportation options - increases personal and corporate transportation costs.
 10. Uncompensated auto accidents - increases personal costs.
 11. Congestion- increases personal costs and losses.

COST PER PARKING SPACE ADDED (\$2002)



Brown, Hess and Shoup 2003

Recent downtown garage costs

Cost Per Space Added Recent Parking Garages

Boston, PO Sq. (1990):	\$34,000
Walnut Creek (1994):	\$32,400
Children's Hosp. (1996):	\$40,000
Palo Alto (2002):	\$50,994
MIT Stata (2004):	\$60,000
San Jose (2004):	\$77,000
Seattle (2005):	\$70,000
Fairfax VA (2004):	\$16,000
Colorado (2006):	\$15,000
Lowell (2007):	\$24,000



~\$25,000 per space



~\$30,000 per space



\$24,000 per space



Monthly Cost Per Parking Space

Lowell Municipal Garage

900 spaces

\$21M

Assume:

- \$24,000 per space added
- 6.0% interest
- 40 year lifespan

Result:

- **\$129 per space per month**



Total Monthly Cost Per Space

What monthly fee would be needed to break even?

Capital	\$129
Operating	\$33
<hr/>	
TOTAL	\$162
(\$7/space per day)	

IMPACT ON LAND USES

A brief history of parking requirements

- 1908 Henry Ford starts his first assembly line
- 1923 Columbus Ohio adopts first off-street parking requirement
- 1939 Fresno adopts first parking requirement for any use besides housing, adopting them for hotels and hospitals
- 1946 survey: only 17% of cities have parking requirements
- 1951, 71% of these cities have parking requirements or are adopting them.



Parking Standards

Edited by
Michael Davidson and Fay Dolnick



American Planning Association



Planning Advisory Service
Report Number 1100-1

a

abattoir (*see* slaughterhouse)
 accessory dwelling unit
 administrative office (*see* office uses)
 adult use
 adult use, adult arcade
 adult use, adult cabaret
 adult use, adult motion picture theater
 adult use, adult theater
 adult use, book store
 adult use, entertainment facility
 adult use, massage parlor (*see also* massage establishment)
 adult use, sex novelty shop
 advertising agency (*see also* office use)
 agricultural use, unless otherwise specified (*see also* farm uses)
 agricultural processing plant (*see also* industrial uses)
 agricultural-related industry (*see also* agricultural use, unless otherwise specified)
 agricultural sales and service use (*see also* farm supply store; feed store)
 aircraft charter service
 airport (*see also* airport terminal)
 airport hangar
 airport, local/private use
 airport terminal (*see also* airport; transportation terminal)
 ambulance service
 amphitheater (*see also* stadium)
 amusement enterprise (*see also* recreation facility uses)
 amusement enterprise, indoor
 amusement enterprise, outdoor
 amusement park
 amusement park, children's
 amusement park, water
 ancillary use (*see* accessory use)
 animal boarding facility
 animal breeder establishment
 animal grooming salon
 animal hospital
 animal sales establishment (*see* pet shop)
 animal shelter
 animal training facility
 antique shop (*see also* second-hand store)
 apartment (*see* dwelling, apartment uses)
 apartment hotel (*see* extended-stay hotel)
 apparel store (*see* clothing store)
 appliance and equipment repair establishment (*see also* equipment uses)

appliance sales establishment
 aquaculture use
 aquarium
 arboretum (*see also* botanical gardens; community garden)
 arcade, amusement (*see also* amusement enterprise uses)
 archery range (*see also* rifle range; shooting range)
 arena (*see* stadium)
 armory
 art gallery (*see also* cultural uses)
 art school (*see* educational facilities, school for the arts)
 art supplies store
 artisan workshop (*see also* live-work studio)
 artist studio (*see also* artisan workshop; live-work studio)
 asphalt manufacturing facility (*see also* industrial use, heavy)
 assembly hall (*see also* auditorium; civic center)
 assisted living (*see* elderly housing, assisted living)
 asylum (*see* mental health facility)
 athletic field (*see also* ball field; grandstands; recreation facility uses)
 auction, automobile
 auction house
 auditorium (*see also* assembly hall; civic center)
 automated teller machine (ATM)
 automated teller machine (ATM), exterior, on bank property
 automobile convenience store (*see* gas station, mini-mart)
 automobile dealership (*see also* motor vehicle sales establishment)
 automobile graveyard (*see* automobile salvage yard; junk yard)
 automobile impound facility (*see also* towing service)
 automobile laundry (*see* car wash uses)
 automobile maintenance, quick service establishment (*see also* automobile repair service establishment)
 automobile mail (*see* automobile dealership uses)
 automobile parts store
 automobile rental establishment (*see also* motor vehicle rental establishment)
 automobile repair service establishment (*see also* gas station; motor vehicle repair service establishment; tire store and

service establishment)
 automobile salvage yard (*see also* junk yard)
 automobile service station (*see also* gas station)
b
 bait shop (*see also* retail use, unless otherwise specified)
 bakery
 bakery, wholesale
 ball field (*see also* athletic field; grandstands; recreation facility uses)
 ballroom (*see also* banquet hall; dance hall)
 bank (*see also* accessory banking; automated teller machine (ATM); credit union)
 bank, drive-thru only (*see also* drive-thru use, unless otherwise specified)
 bank with drive-thru (*see also* drive-thru use, unless otherwise specified)
 bank, without drive-thru
 banquet hall (*see also* ballroom; dining room; meeting hall)
 bar (*see also* beer garden; bottle club; brew pub; night club)
 barber shop (*see also* beauty shop; personal services establishment)
 baseball field (*see* ballfield)
 basketball court
 batch plant (*see* concrete production plant)
 bathhouse (*see also* health spa; sauna bath)
 batting cage facility
 beach, commercial
 beach, community
 beauty shop (*see also* barber shop; personal services establishment)
 beauty school (*see also* educational facility; trade school)
 bed and breakfast home
 bed and breakfast inn (*see also* tourist home)
 beer garden (*see also* outdoor seating area)
 bicycle rental and repair shop
 bicycle repair shop
 bicycle sales shop
 billiard hall (*see* pool hall)
 big box retail establishment (*see also* department store; shopping center uses)
 bingo hall
 blood donor center
 blueprinting shop (*see also* copy shop; printing and publishing facility)
 boarding house (*see also* lodging house; rooming house)

TABLE 3-4

PATAPHYSICAL PARKING REQUIREMENTS

Land use	Parking requirement
Adult entertainment	1 space per patron, plus 1 space per employee on the largest working shift
Barber shop	2 spaces per barber
Beauty shop	3 spaces per beautician
Bicycle repair	3 spaces per 1,000 square feet
Bowling alley	1 space for each employee and employer, plus 5 spaces for each lane
Gas station	1.5 spaces per fuel nozzle
Health home	1 space per 3 beds and bassinets, plus 1 space per 3 employees, plus 1 space per staff doctor
Heating supply	3.33 spaces for every 1,000 square feet of sales and office area, plus 2 spaces per 3 employees on the maximum shift, plus 1 space for every vehicle customarily used in operation of the use or stored on the premises
Heliport	1 space per 5 employees, plus 5 spaces per touchdown pad
Machinery sales	1 space per 500 square feet of enclosed sales/rental floor area, plus 1 space per 2,500 square feet of open sales/rental display lot area, plus 2 spaces per service bay, plus 1 space per employee, but never less than 5 spaces
Mausoleum	10 spaces per maximum number of interments in a one-hour period
Nunnery	1 space per 10 nuns
Rectory	3 spaces per 4 clergymen
Swimming pool	1 space per 2,500 gallons of water
Taxi stand	1 space for each employee on the largest shift, plus 1 space per taxi, plus sufficient spaces to accommodate the largest number of visitors that may be expected at any one time
Tennis court	1 space per player

Sources: Planning Advisory Service (1964, 1971, and 1991); Witheford and Kanaan (1972)

Palo Alto, CA – parking requirements adopted in 1951







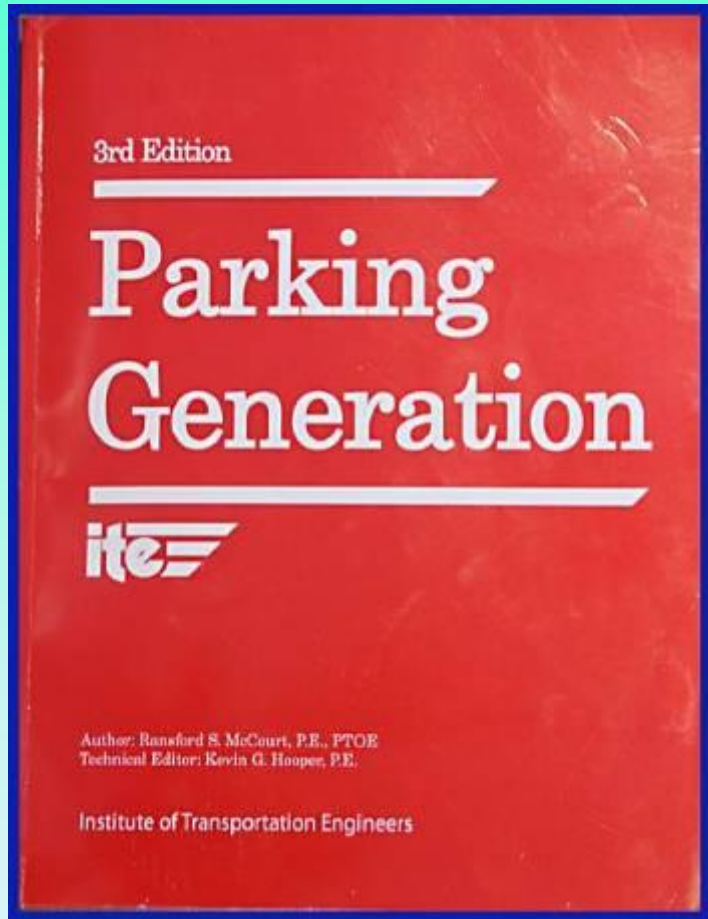




REAL VERSUS PERCEIVED DEMAND

Institute of Transportation Engineers

Parking Generation Manual



- The parking generation rate is the peak parking occupancy observed at a site.
- Data are derived from single-use suburban developments with free parking and little or no transit ridership.

FAST FOOD RESTAURANT WITH DRIVE-IN WINDOW (836)

Peak Parking Spaces Occupied vs: 1,000 GROSS SQUARE FEET
LEASABLE AREA

On a: WEEKDAY

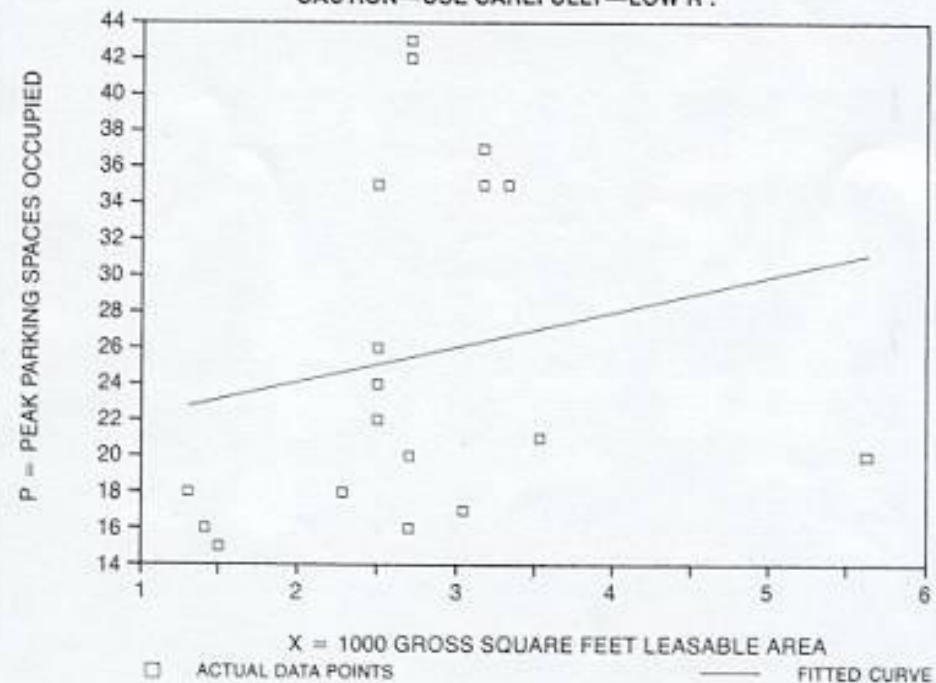
PARKING GENERATION RATES

Average Rate	Range of Rates	Standard Deviation	Number of Studies	Average 1,000 GSF Leasable Area
9.95	3.55-15.92	3.41	18	3



DATA PLOT AND EQUATION

CAUTION—USE CAREFULLY—LOW R^2 .



$$\text{Fitted Curve Equation: } P = 1.95(X) + 20.0$$

$$R^2 = 0.038$$



3rd Edition

Parking Generation

ite

Author: Ransford S. McCourt, P.E., PTOE
Technical Editor: Kevin G. Hooper, P.E.

Institute of Transportation Engineers

Conclusion:

- Parking occupancy is unrelated to floor area in this sample.
- The parking generation rate of 9.95 spaces per 1,000 square feet looks accurate because it is so precise, but the precision is misleading.

Two Aspects of Parking Requirements

1. For a new building, parking requirements determine the number of spaces a developer must *supply*.
2. For an existing building, parking requirements limit the uses a city will *allow*.

Minimum Parking Requirements - Source



Example: Office Parks

Peak Occupancy Rates, in spaces per 1000 sf of building area:

Lowest: 0.94 spaces

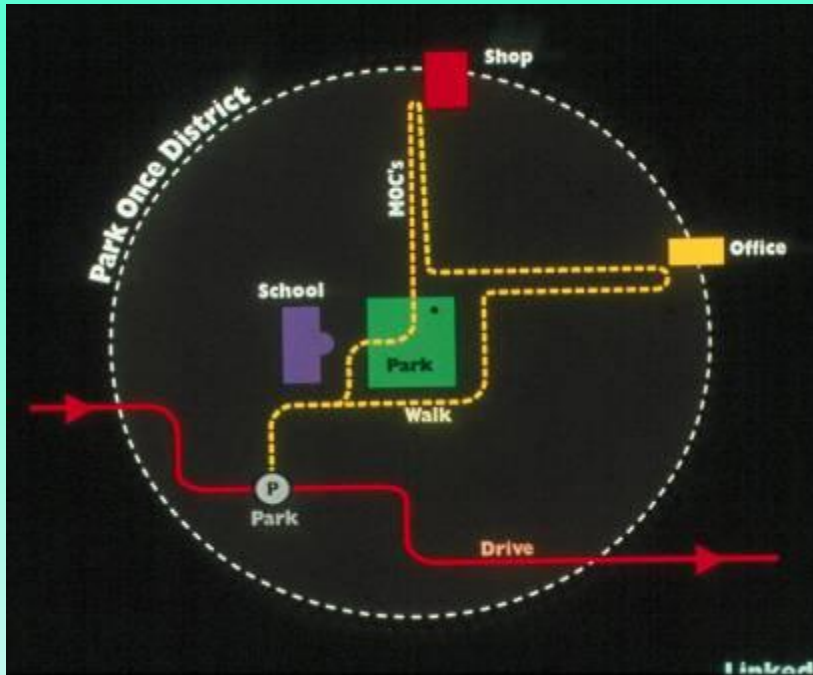
Average: 2.52 spaces

Highest: 4.25 spaces

Typical requirement:

4.0 spaces/1000 sf

Demand vs. Requirement: Downtown Palo Alto



Observed peak occupancy:

- 1.91 spaces per 1,000 s.f.

Peak occupancy w/ 10% vacancy:

- 2.1 spaces per 1,000 s.f.

Existing Requirement:

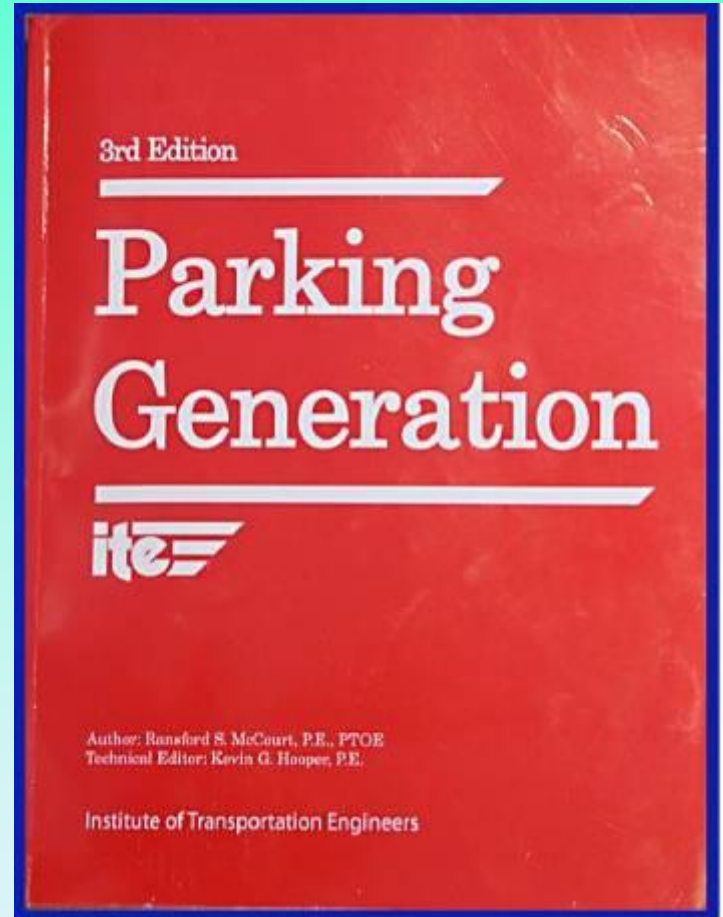
- 4 spaces per 1,000 s.f.
- Would require 5,210 more spaces than observed demand to bring downtown to 4 spaces per 1,000 sf requirement
- At \$51K/space = \$298 million

Parking Demand in Four Main St. Districts

City	City Pop.	Mode Split (Employee Commuting)							Occupied Parking Spaces per 1,000 sf (non-res)
		<i>Drove Alone</i>	<i>2 or More Person Carpool</i>	<i>Transit</i>	<i>Bicycle</i>	<i>Walked</i>	<i>Other Means</i>	<i>Worked at Home</i>	
Chico	59,900	61%	12%	1%	11%	13%	1%	1%	1.7
Palo Alto	58,600	80%	9%	4%	3%	3%	1%	0%	1.9
Santa Monica	84,100	74%	11%	11%	1%	2%	1%	0%	1.8
Kirkland, WA	45,600	77%	12%	4%	0%	2%	1%	4%	1.6

Residential: What the Industry Says

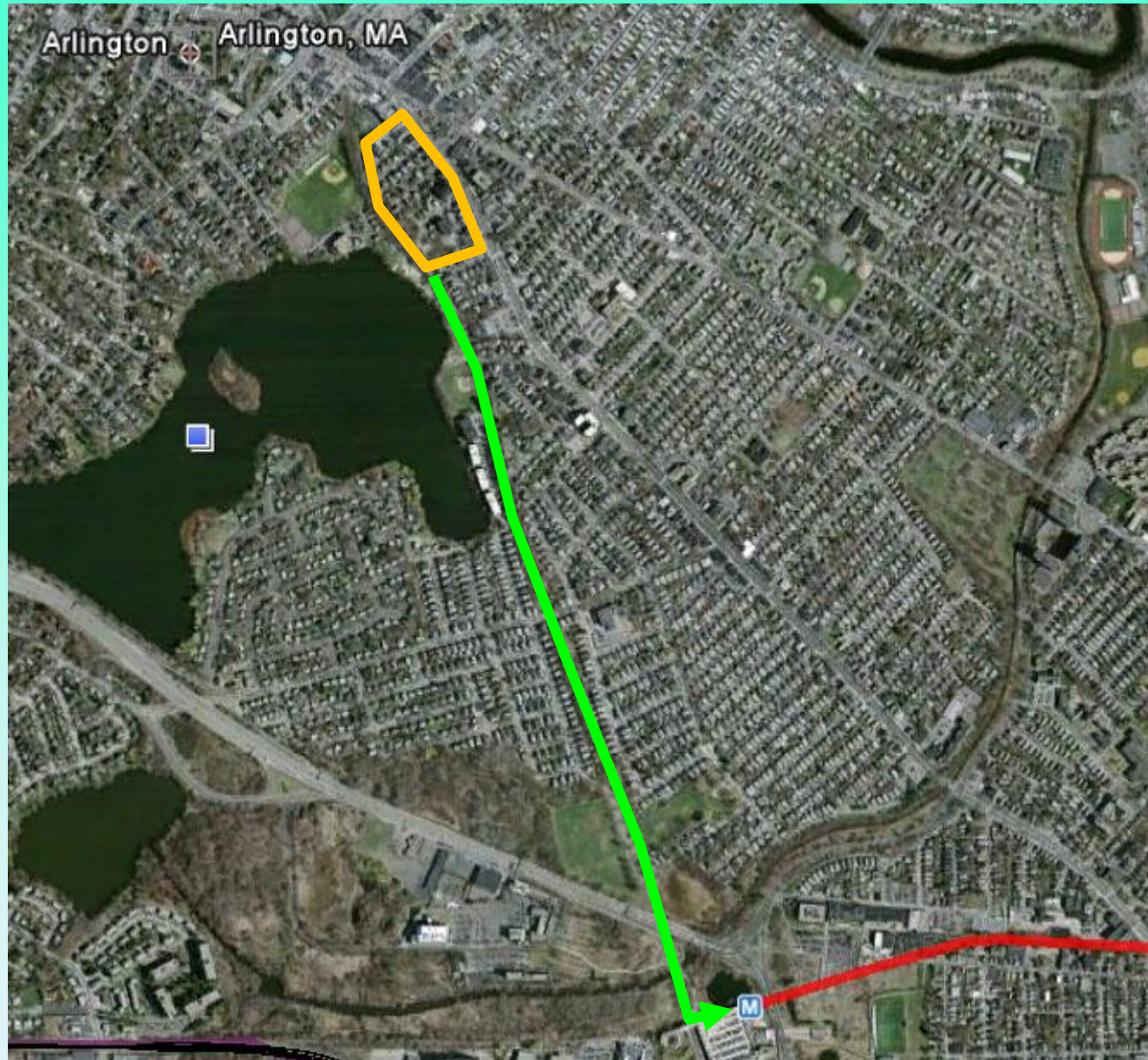
- ITE parking demand (2000 3rd edition) for stand-alone condos (no transit):
1.18 per unit
- Standard internal capture reduction is 5%:
1.12 per unit
- Standard TDM & unbundling reduction is 15%:
.95 per unit
- Further transit reductions...



Residential: What our zoning says

- Brookline: 2/unit
- Somerville: 1-3/unit
- Cambridge: 1/unit
- Greater Boston: 1.5-4/unit

Legacy at Arlington Center, Arlington



Source: KSS Realty Trust

Legacy at Arlington Center, Arlington

1.5 mi. to Red Line

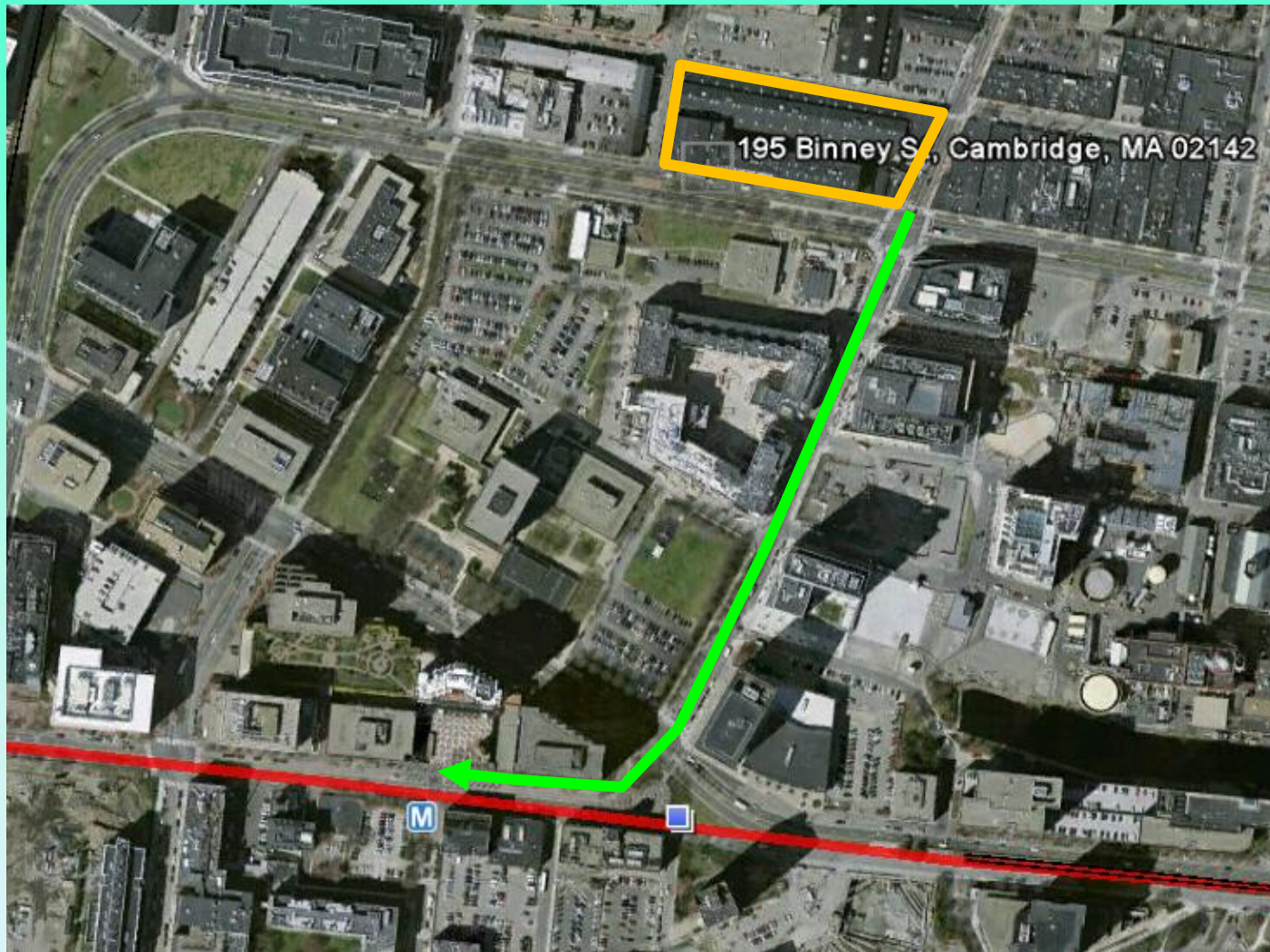
18 one-BRs & 116 two-BRs

1.23 spaces utilized per dwelling unit
(.66 per bedroom)



Source: KSS Realty Trust

Kendall Sq, 195 Binney St., Cambridge

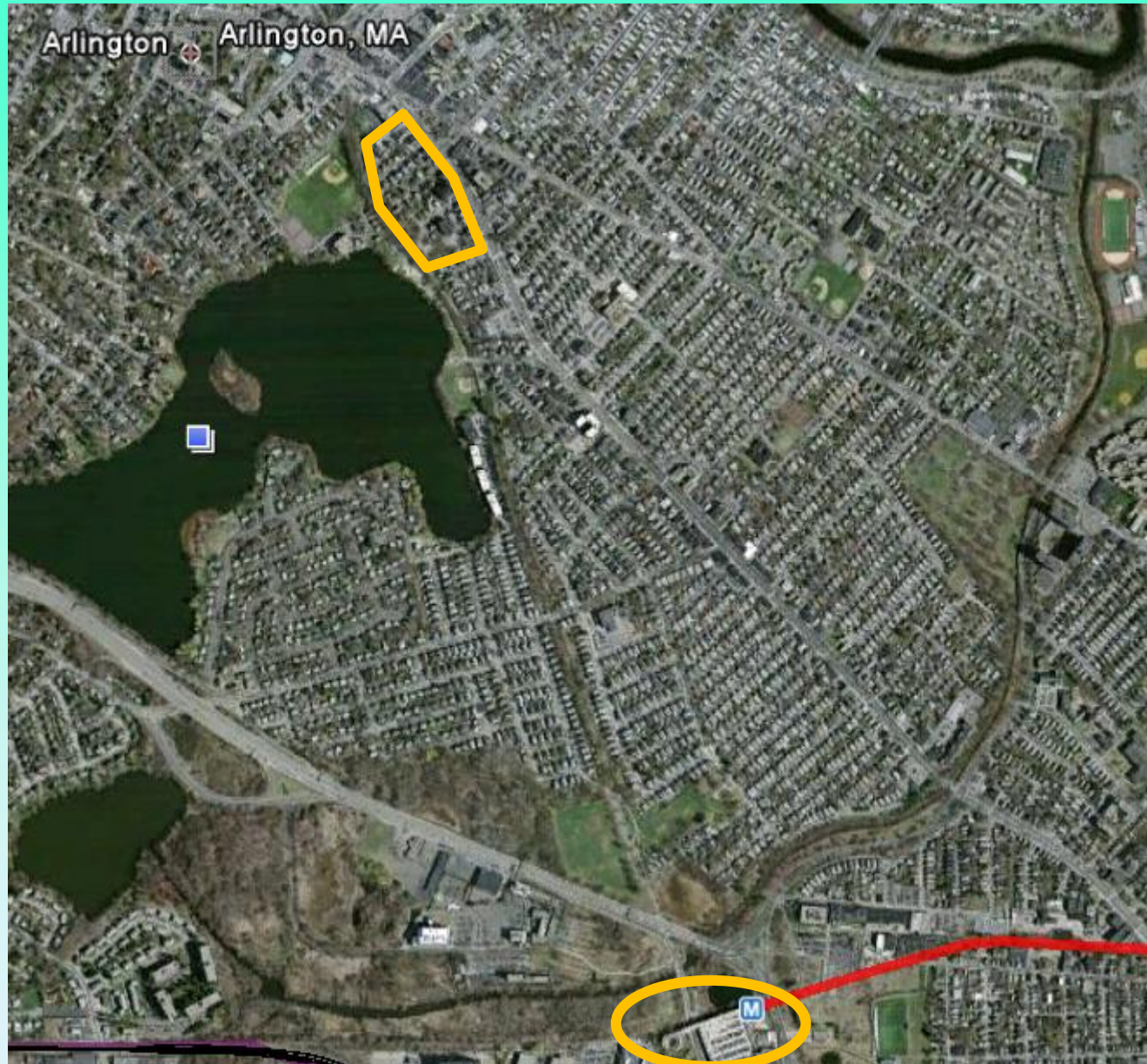


Kendall Sq, 195 Binney St., Cambridge
.4 miles Red Line Stop
15 studios, 15 one-BRs & 155 two-BRs
.79 spaces utilized per dwelling unit
(.43 spaces per bedroom)



Source: KSS Realty Trust

Alewife Station, Cambridge



Source: KSS Realty Trust

Alewife Station, Cambridge

At Red Line Stop

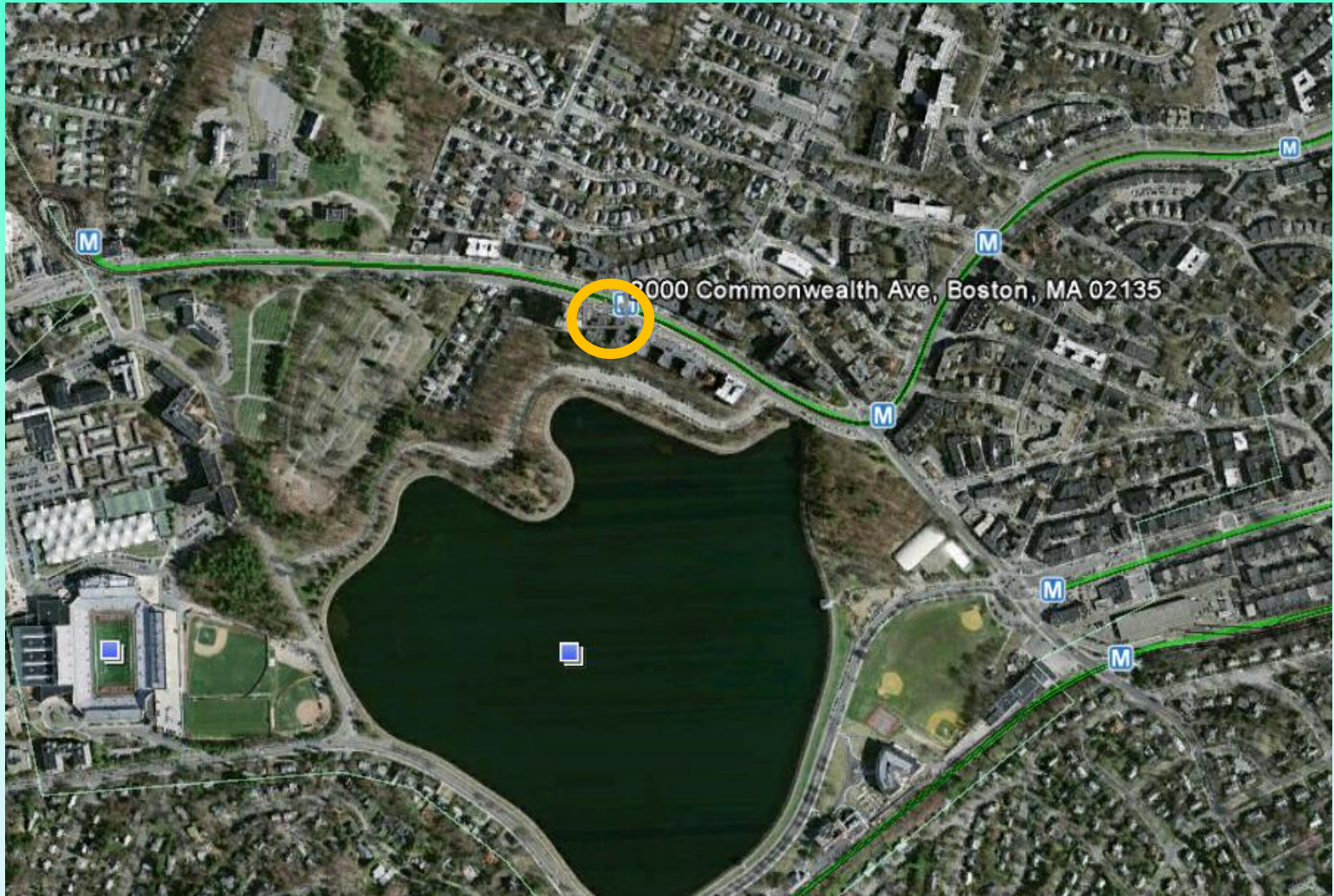
5 Studios, 120 one-BRs & 187 two-BRs

.82 spaces utilized per dwelling unit
(**.51** spaces per bedroom)



Source: KSS Realty Trust

2000 Commonwealth Ave., Brighton

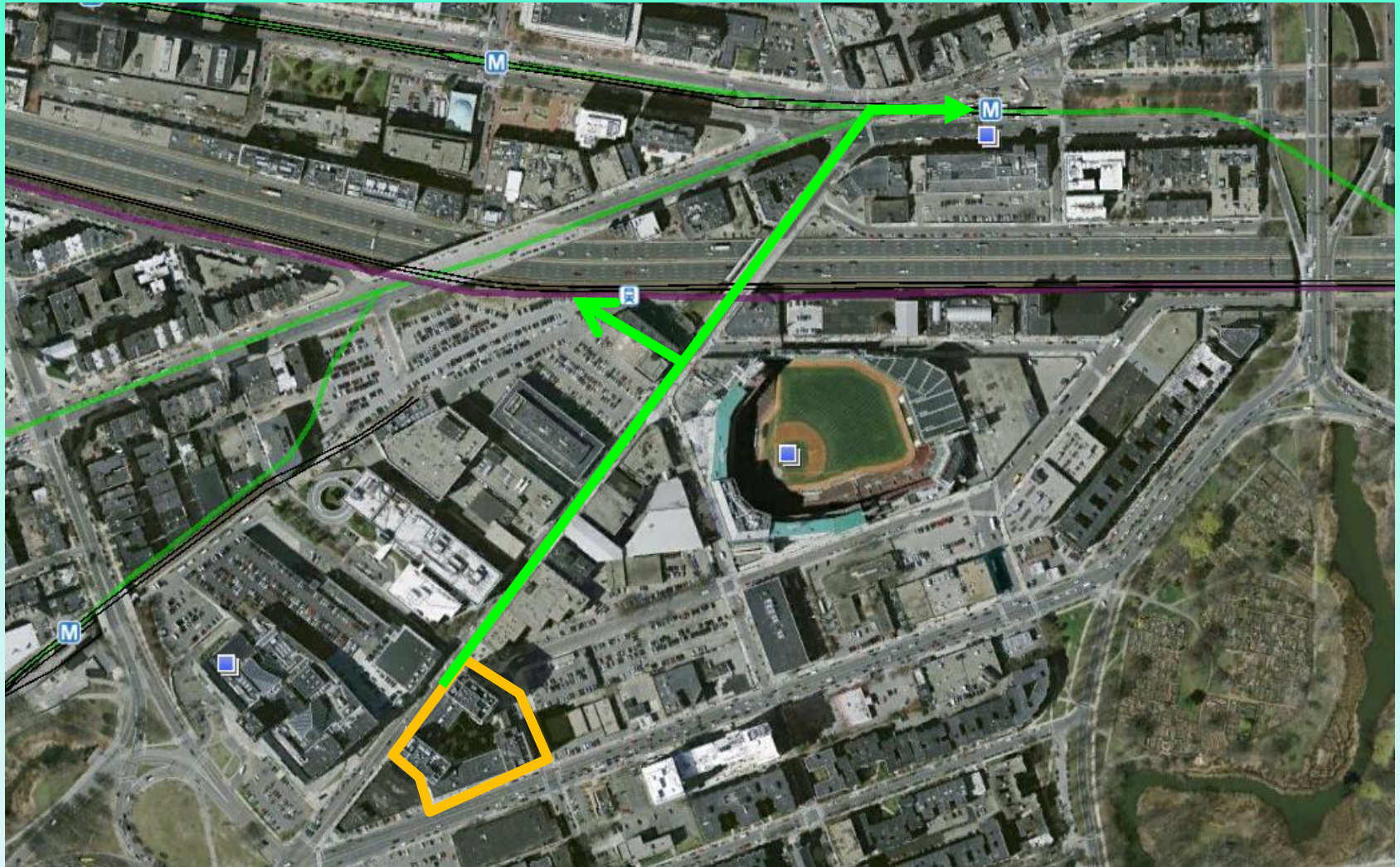


2000 Commonwealth Ave., Brighton
Along Green Line
94 one-BRs & 94 two-BRs
.69 spaces utilized per dwelling unit
(.46 spaces per bedroom)



Source: KSS Realty Trust

Fenway Mixed-Use, Boston



Fenway Mixed-Use, Boston

.4 mi. to Green Line Stop

580 units

.86 spaces provided per dwelling unit



Ashmont Village, Dorchester

Near Red Line Stop

116 units

.80 spaces provided per dwelling unit



Ten Faxon Apartments, Quincy

Near Red Line stop

200 units

1.02 spaces provided per dwelling unit

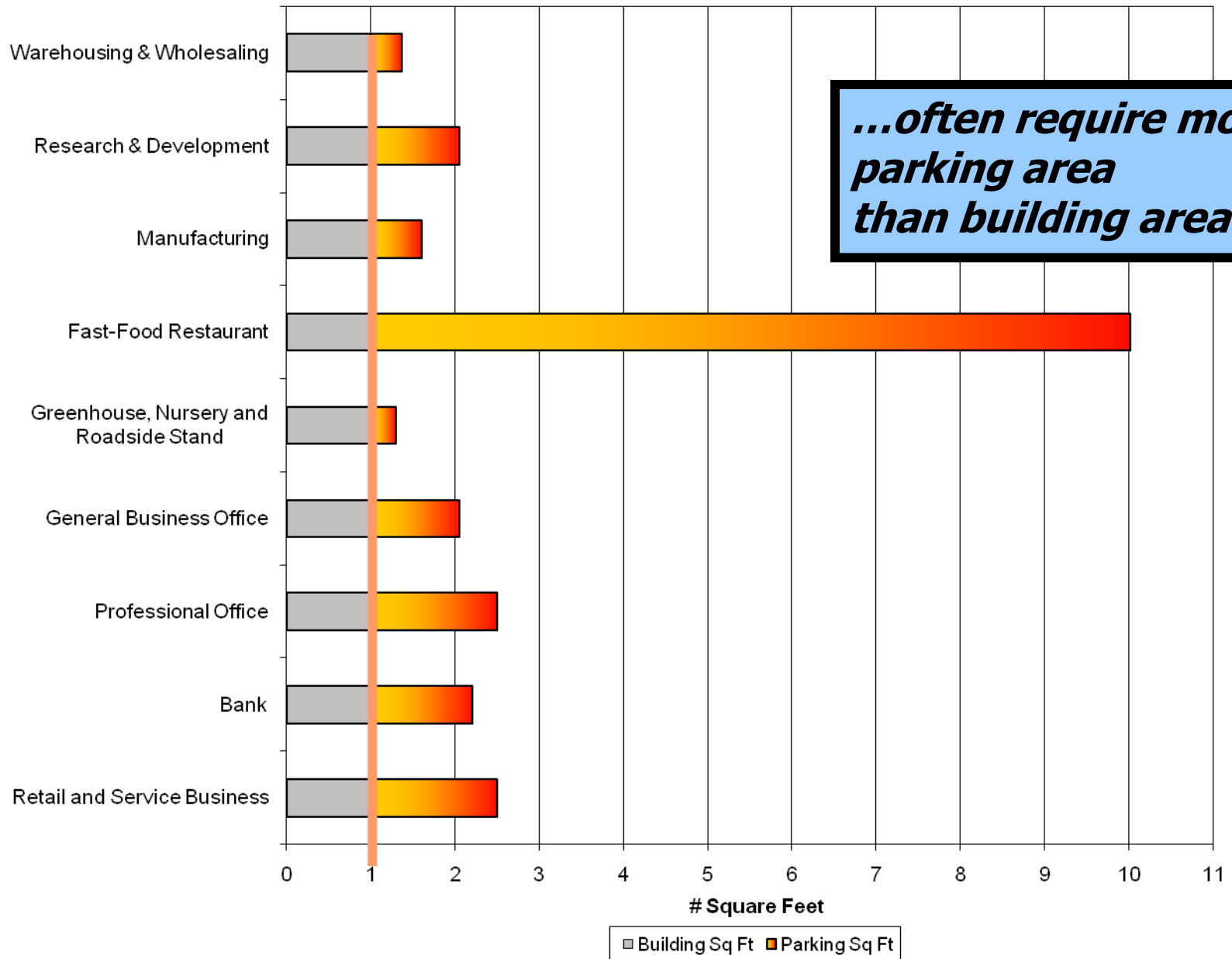


Typical office: 4 parking spaces per 1000 sq.ft.

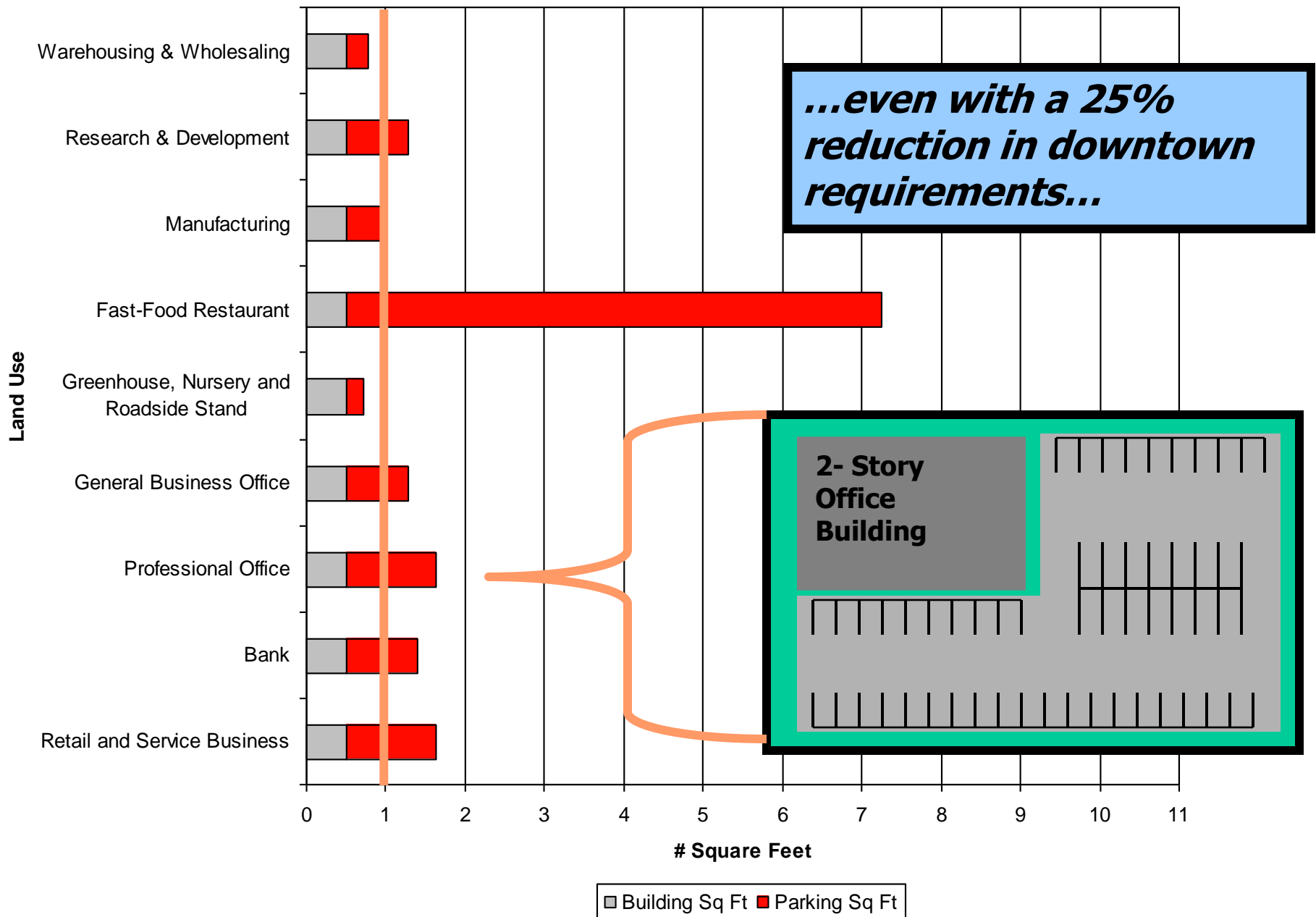
1.3 sq. ft. of asphalt per sq. ft. of building area



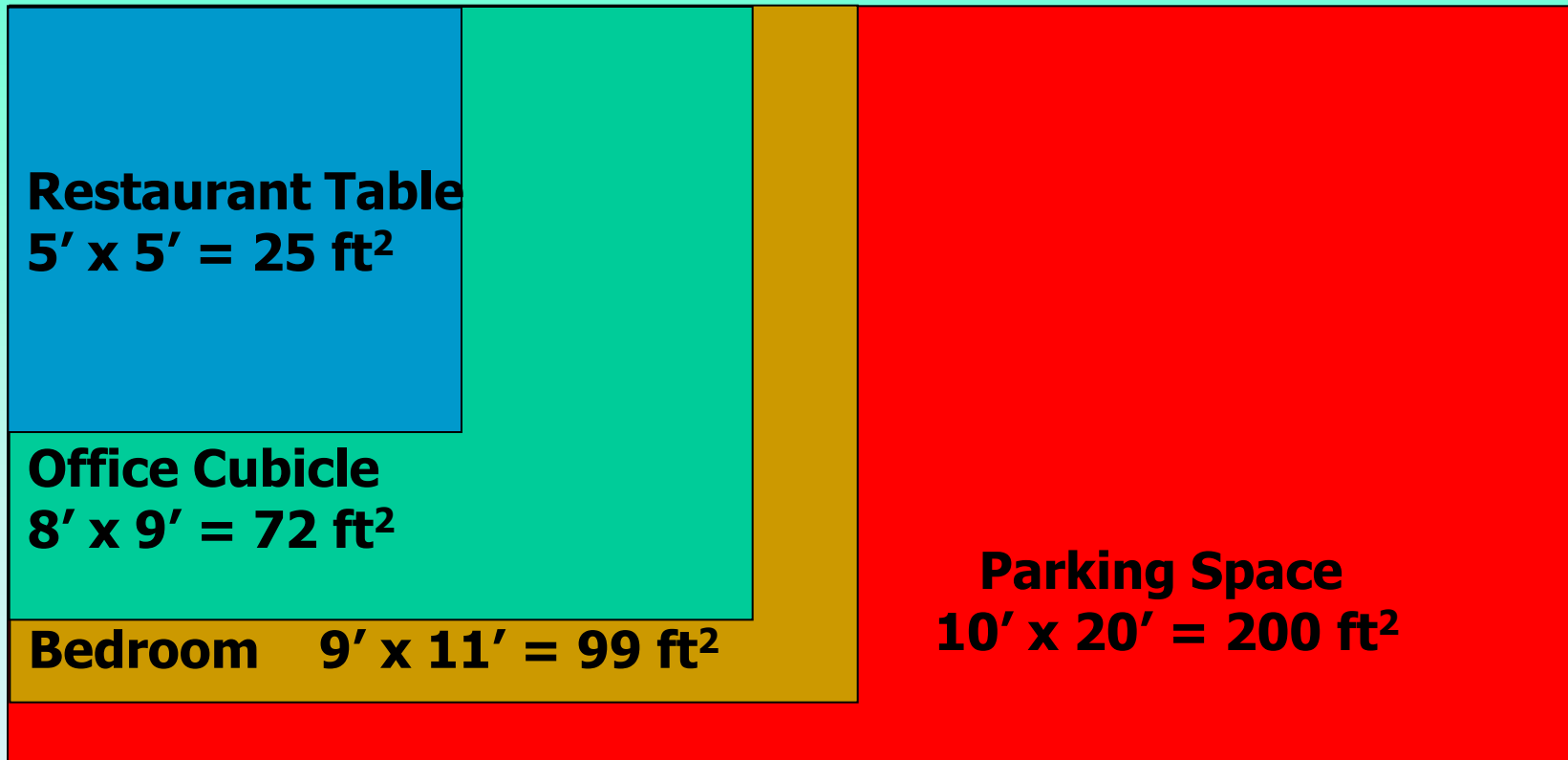
Current Parking Requirements: Hingham



Current Parking Requirements: Hingham

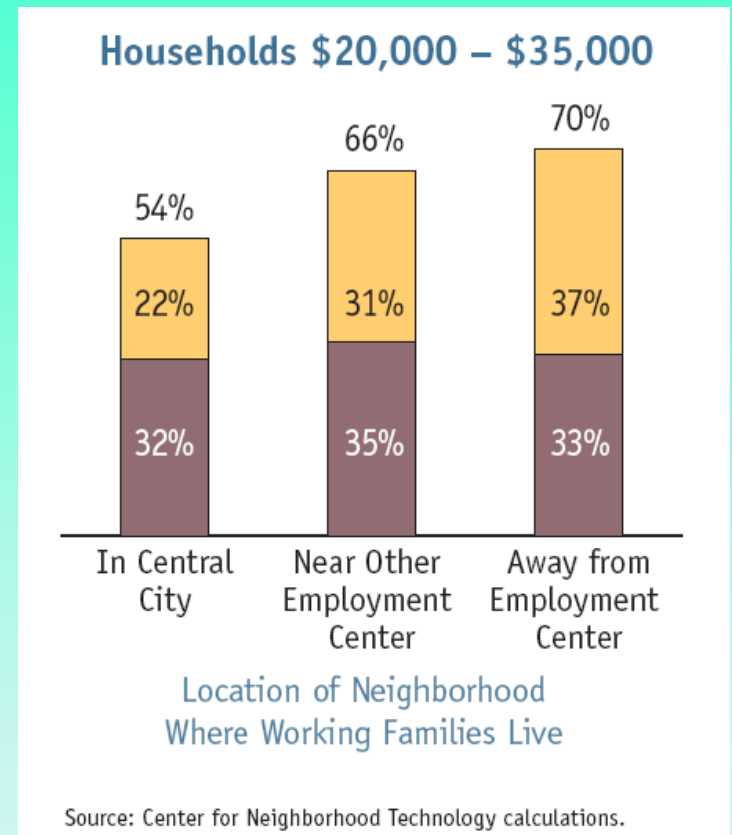


What Land Value Are We Losing?



Parking Worsens Housing Affordability

- For each parking space required in a residential unit:
 - Price of unit increases 15-30%
 - Number of units that can be built on typical parcel decreases 15-25%
- Working families spend more on transportation than housing in auto-oriented suburbs.
- No accommodation for car-free households: Getting rid of a car = extra \$100,000 in mortgage
- At >300 sq ft, each parking space consumes more space than an efficiency apartment

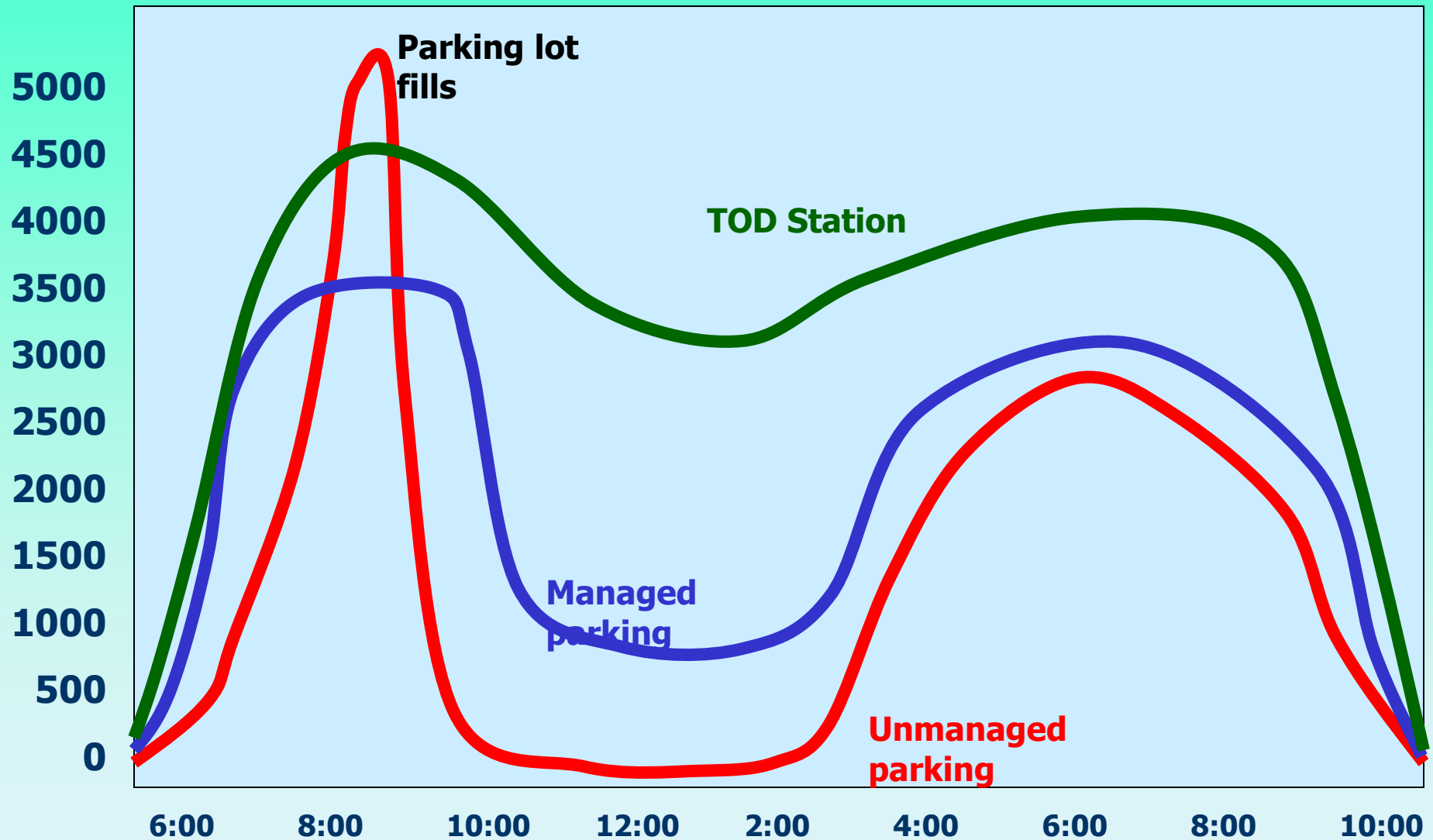


Sources: "A Heavy Load: The Combined Housing and Transportation Burdens of Working Families," Center for Neighborhood Technology, 2006. "The Affordability Index: A New Tool for Measuring the True Affordability of a Housing Choice," Center for Neighborhood Technology, 2008. Sedway Cook studies of parking and housing costs in San Francisco and Oakland.

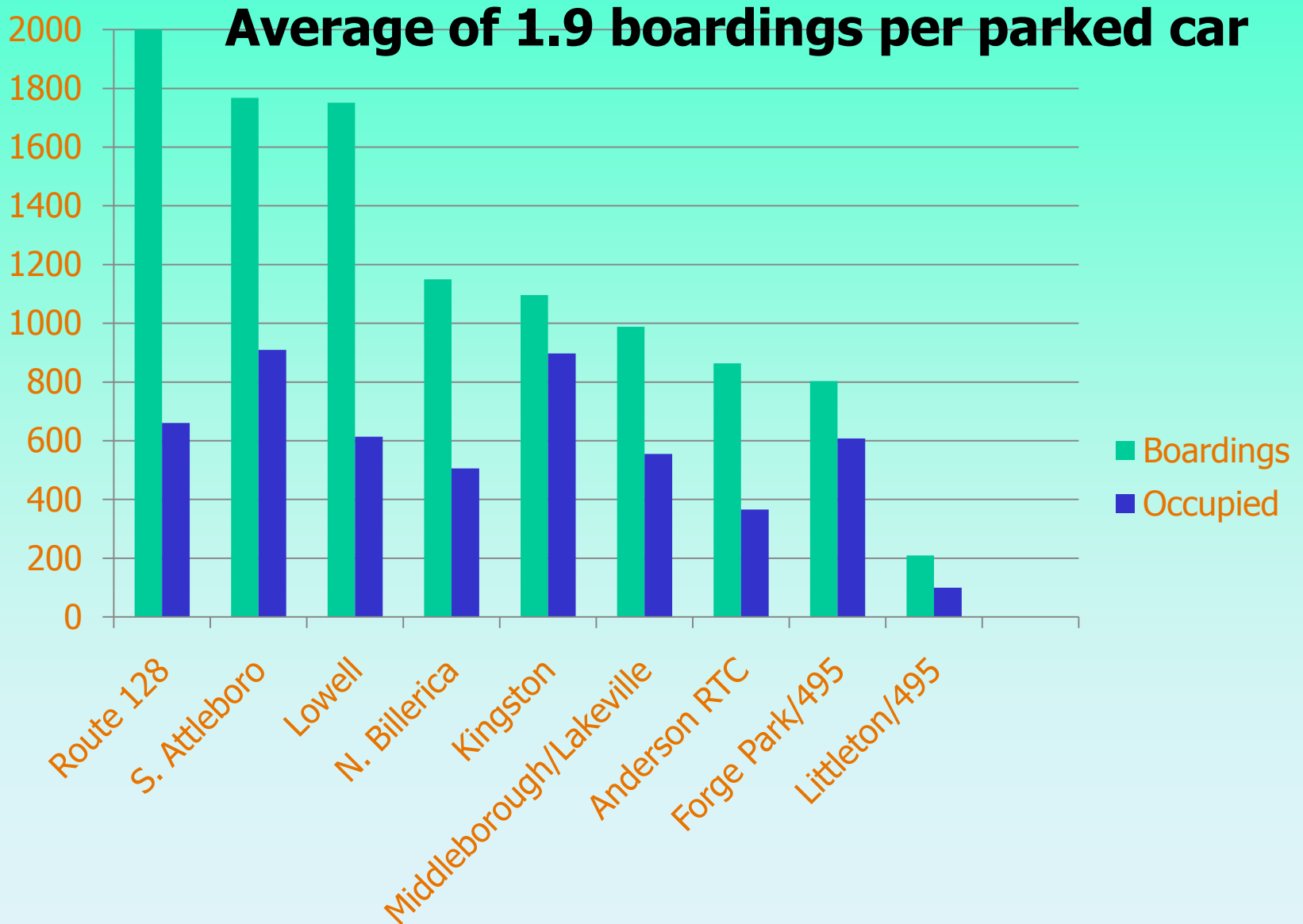
Commuter Rail Parking Demand



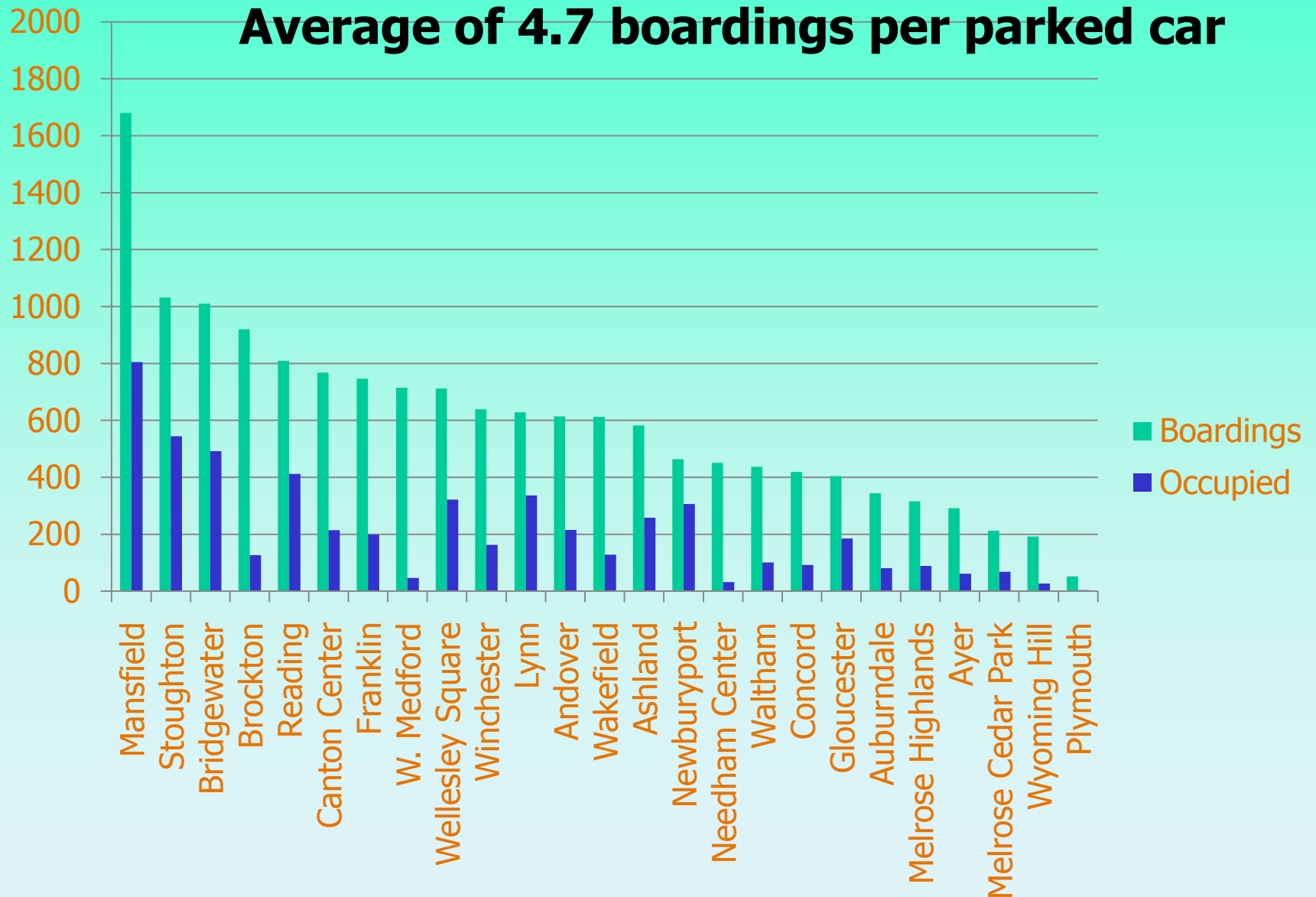
Park & Ride Versus TOD



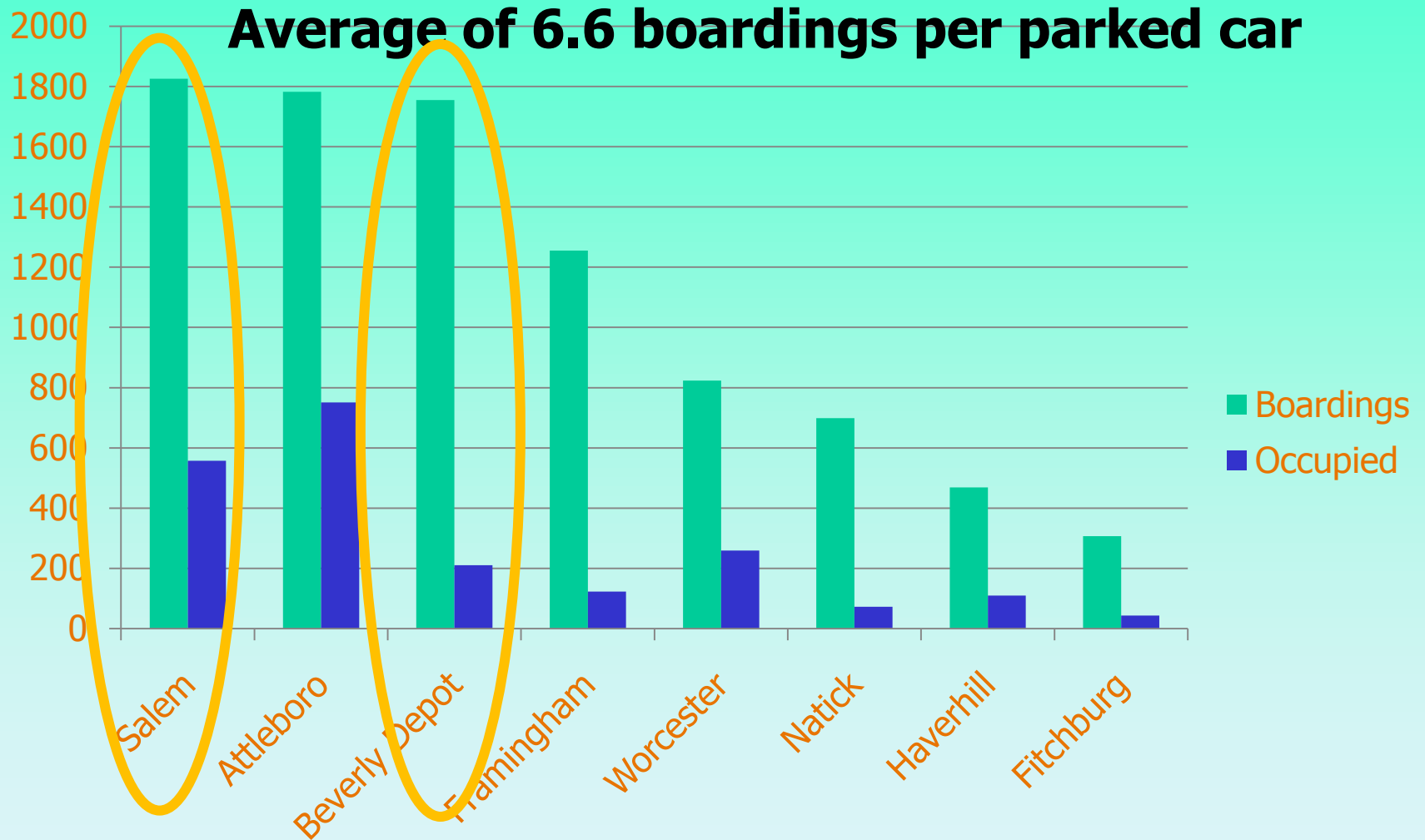
MBTA Commuter Rail: Park & Ride Stations



MBTA Commuter Rail: Village Settings

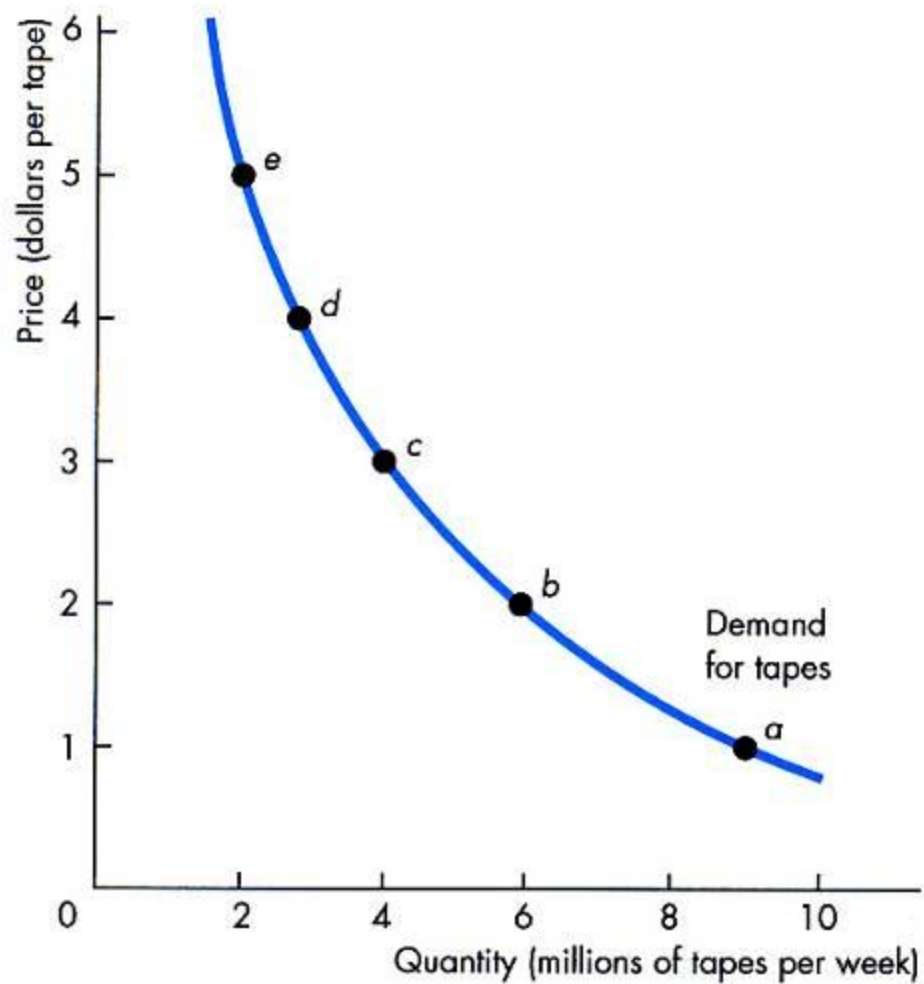


MBTA Commuter Rail: Downtowns



SENSITIVITY TO PRICING

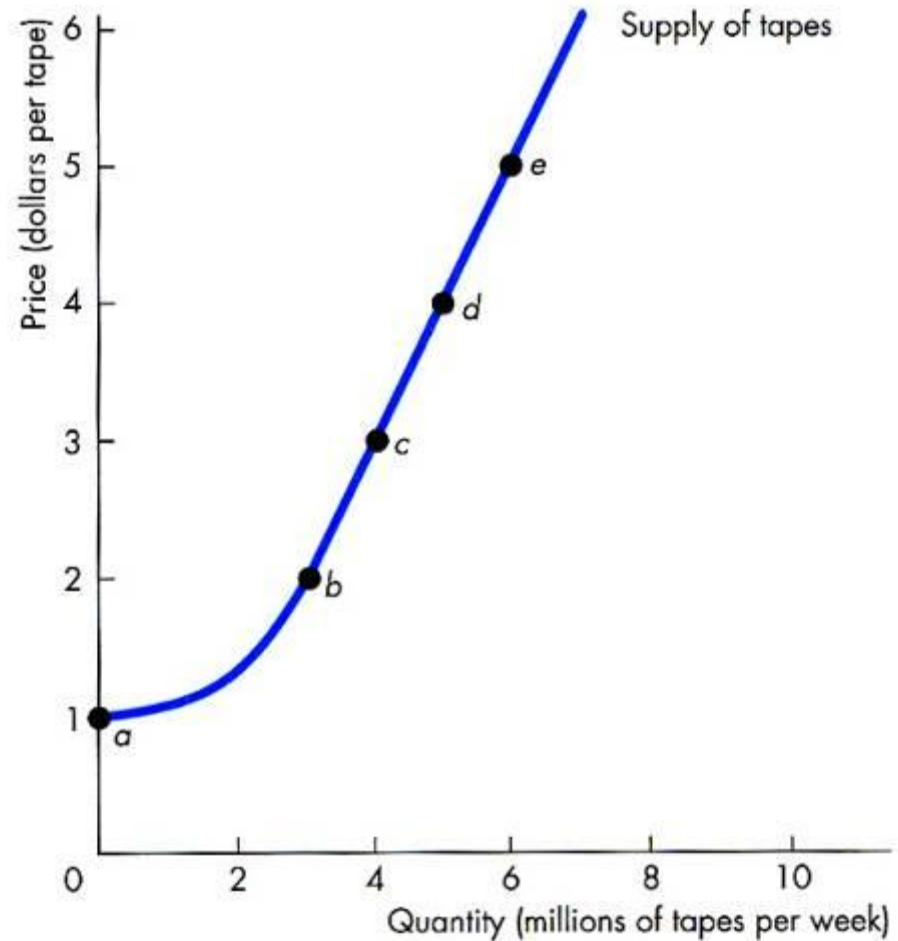
Figure 4.1 The Demand Schedule and the Demand Curve



The Demand Curve

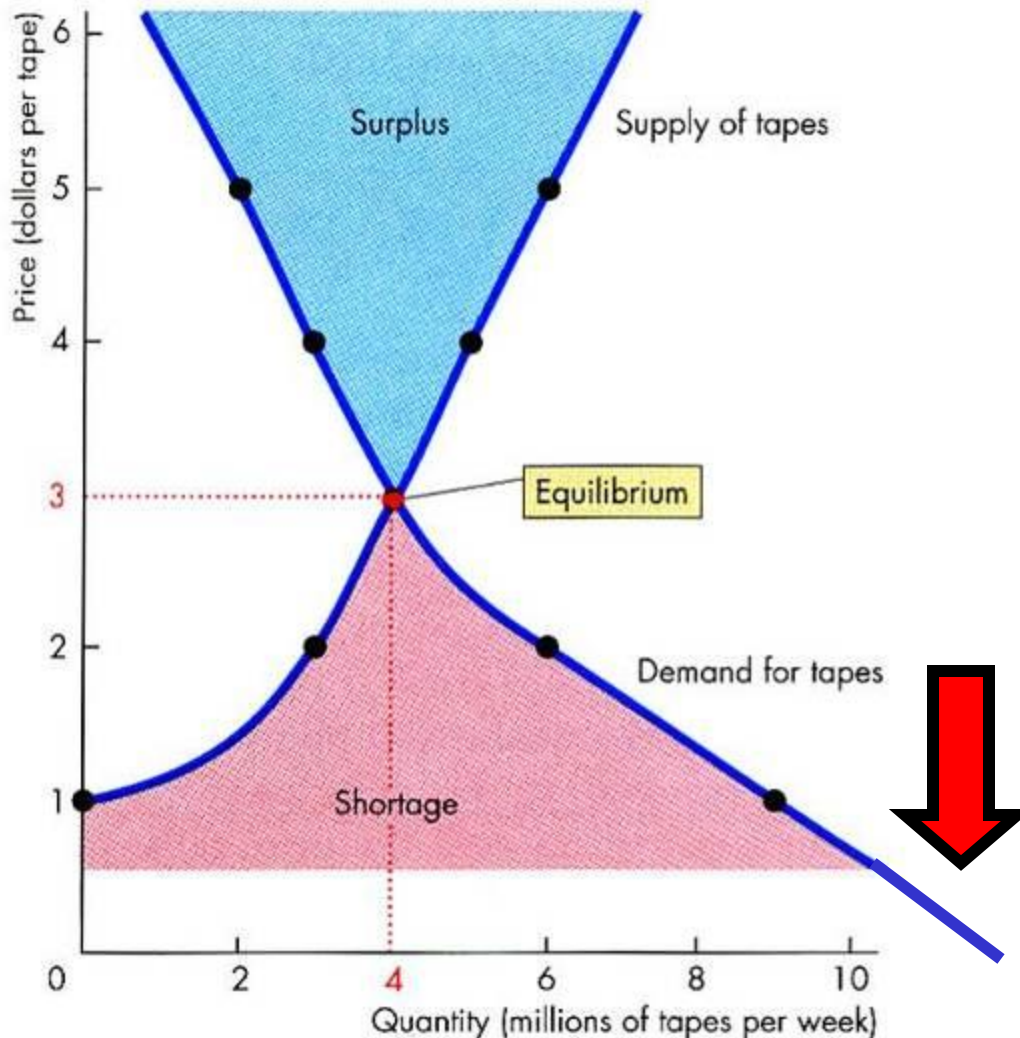
The Supply Curve

Figure 4.4 The Supply Schedule and the Supply Curve



Economists' Laws of Supply and Demand

Figure 4.7 Equilibrium



❖ **The Law of Demand:**
Other things being equal, the higher the price of a good, the lower the quantity demanded.

❖ **The Law of Supply:**
Other things being equal, the higher the price of a good, the greater the quantity supplied.

Source: Economics, Michael Parkin

search in: ☐ only search titles
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[<< Prev](#)

Found: 33 Displaying: 1 - 33

Apr 3 - [195. PRIVATE OFF STREET PARKING IN DRIVEWAY](#) - (CAMBRIDGE)

Apr 3 - [\\$150 why pay to store that junk or unwanted car we buy it for cash!](#) - (617-866-1291 sameday removal) [pic](#)

Apr 2 - [\\$125 Off street parking-near Inman Square](#) - (Beacon street near Inman Square)

Apr 2 - [\\$150 - park indoors and access your car or van 24/7 - Medford Square](#) - (Medford Square)

Apr 2 - [195. PARKING SPACE, 5 MIN. TO HARVARD SQ.](#) - (CAMBRIDGE)

Apr 1 - [\\$175 Off-Street Parking spot available in Central Square, available ASAP](#) - (348 Franklin St. Cambridge, MA 02139)

Mar 31 - [\\$150 Parking spot available in Central Square/University Park](#) - (Central Square)

Mar 31 - [175. great parking spot only 5 min. from harvard square](#) - (CAMBRIDGE)

Mar 31 - [\\$130 Central Sq off street parking](#) - (Cambridge)

Mar 31 - [\\$150 Parking Space](#) - (Harvard Square)

Mar 31 - [\\$125 Parking Spot close to Central Square](#) - (Cambridge)

Mar 31 - [200.PARKING, 5 MIN. WALK TO HARVARD SQ./10 MIN. TO CENTRAL SQUARE](#) - (CAMBRIDGE)

Mar 30 - [\\$150 PARKING SPACE - Eletronic Gate, Covered, near T red Line, Elevator](#) - (Cambridge (Between Central & Harvard Sq))

How do parking prices affect demand?

Location	Scope of Study	Financial Incentive Per Month (in 1995 \$)	Decrease in Parking Demand
Century City District, West Los Angeles	3500 employees surveyed at 100+ firms	\$81	15%
Cornell University, Ithaca NY	9000 faculty & staff	\$34	26%
San Fernando Valley, Los Angeles	1 large employer (850 employees)	\$37	30%
Bellevue, WA	1 medium-size firm (430 employees)	\$54	39%
Costa Mesa, CA	State Farm Insurance employees	\$37	22%
<i>Average</i>		\$49	26%

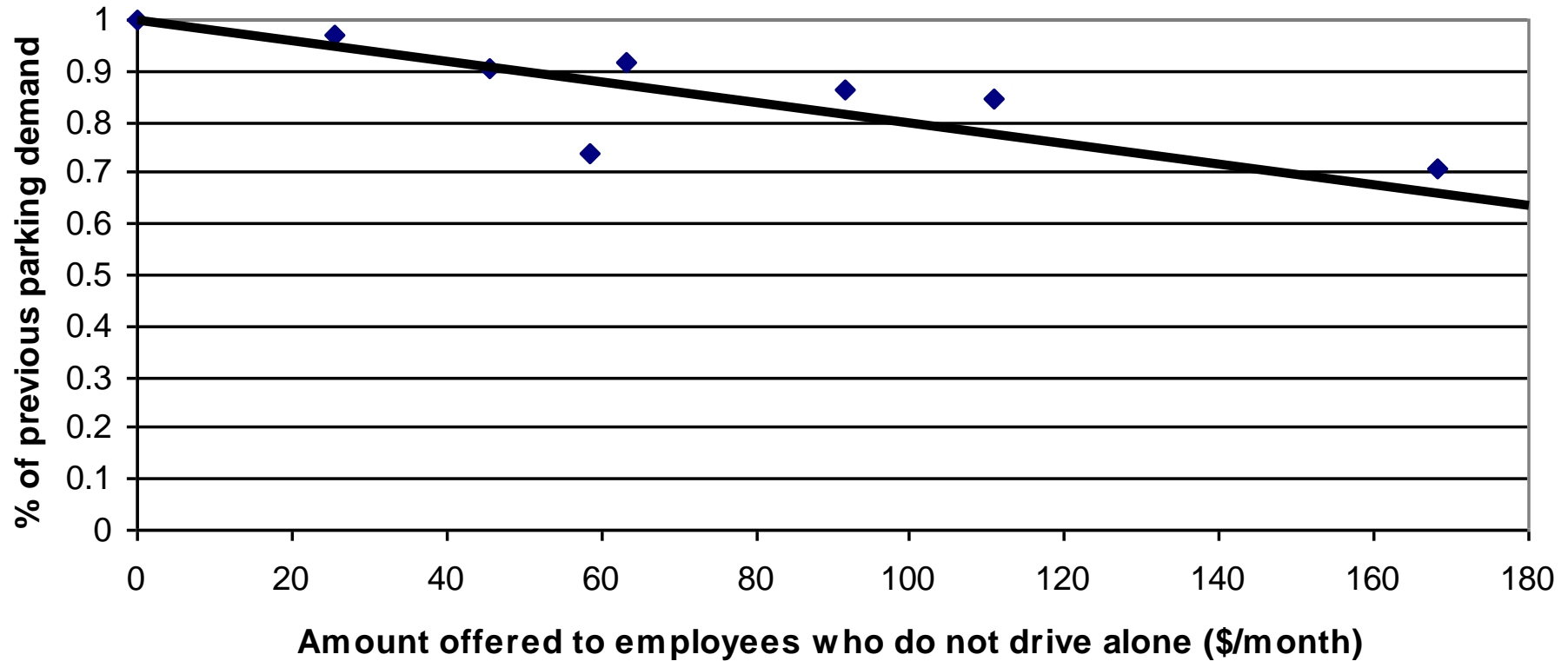
How do parking prices affect demand?

Location	Scope of Study	Financial Incentive Per Month (in 1995 \$)	Decrease in Parking Demand
Los Angeles Civic Center	10,000+ employees at several organizations	\$125	36%
Mid-Wilshire Blvd., Los Angeles	1 mid-size firm	\$89	38%
Washington DC Suburbs	5500 employees at 3 worksites	\$68	26%
Downtown Los Angeles	5000 employees surveyed at 118 firms	\$126	25%
<i>Average</i>		<i>\$102</i>	<i>31%</i>

How do parking prices affect demand?

Location	Scope of Study	Financial Incentive Per Month (in 1995 \$)	Decrease in Parking Demand
University of Washington, Seattle WA	50,000 faculty, staff & students	\$18	24%
Downtown Ottawa, Canada	3500+ government staff	\$72	18%
<i>Average</i>		<i>\$45</i>	<i>21%</i>

Parking Cash-Out: Results



Summary Points

- Parking costs a lot
- Our traditional assumptions about parking demand are wrong
- Parking is a commodity – demand is sensitive to pricing

Coffee!



Session 2

CONDUCTING A PARKING STUDY

UTILIZATION STUDIES

Reading, MA – Case Study



Common Downtown Problems:

- “Not enough parking”
- “No spaces available in front of my business”
- “Charging for parking will drive customers away”
- “We need a parking garage to spur economic development”

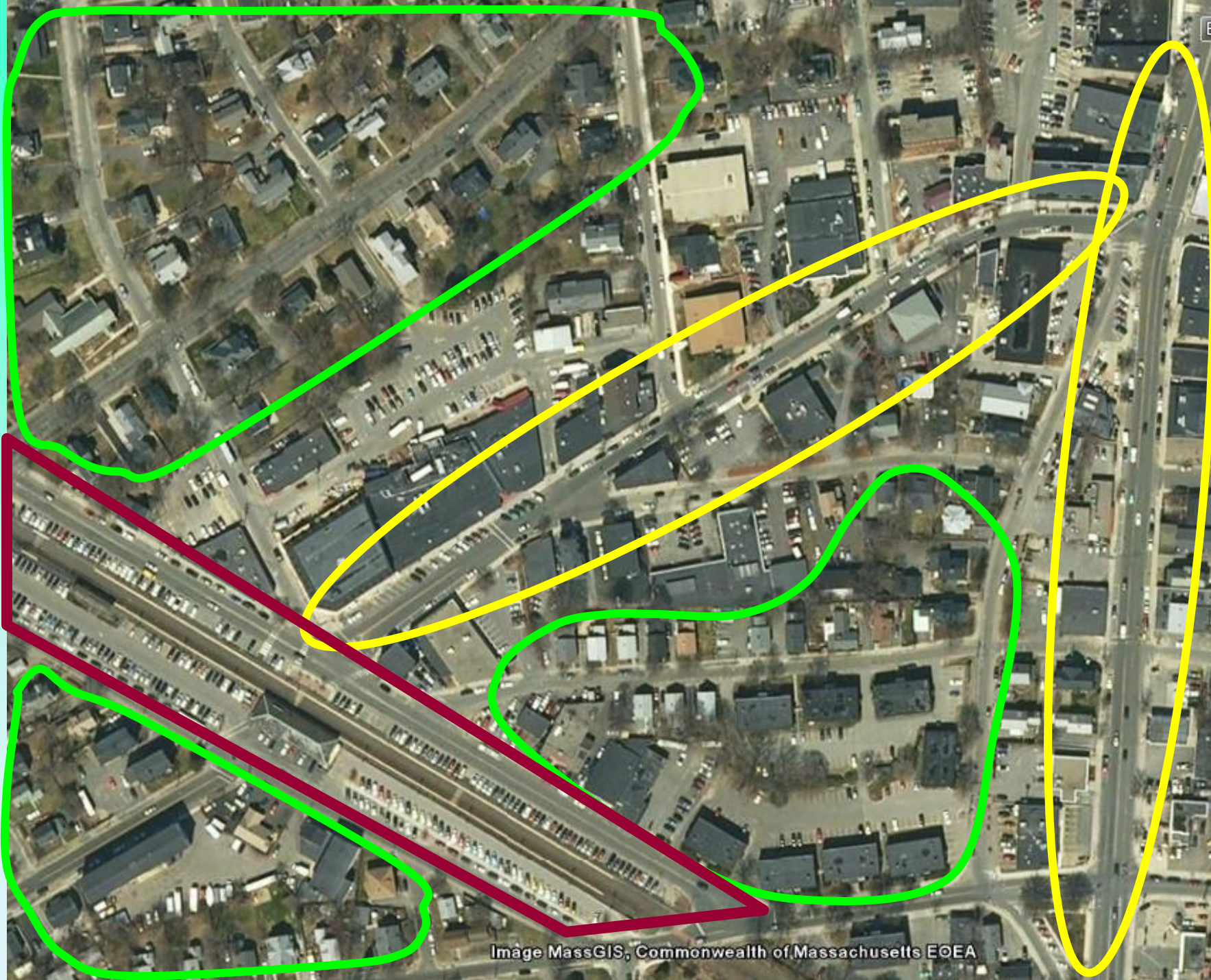
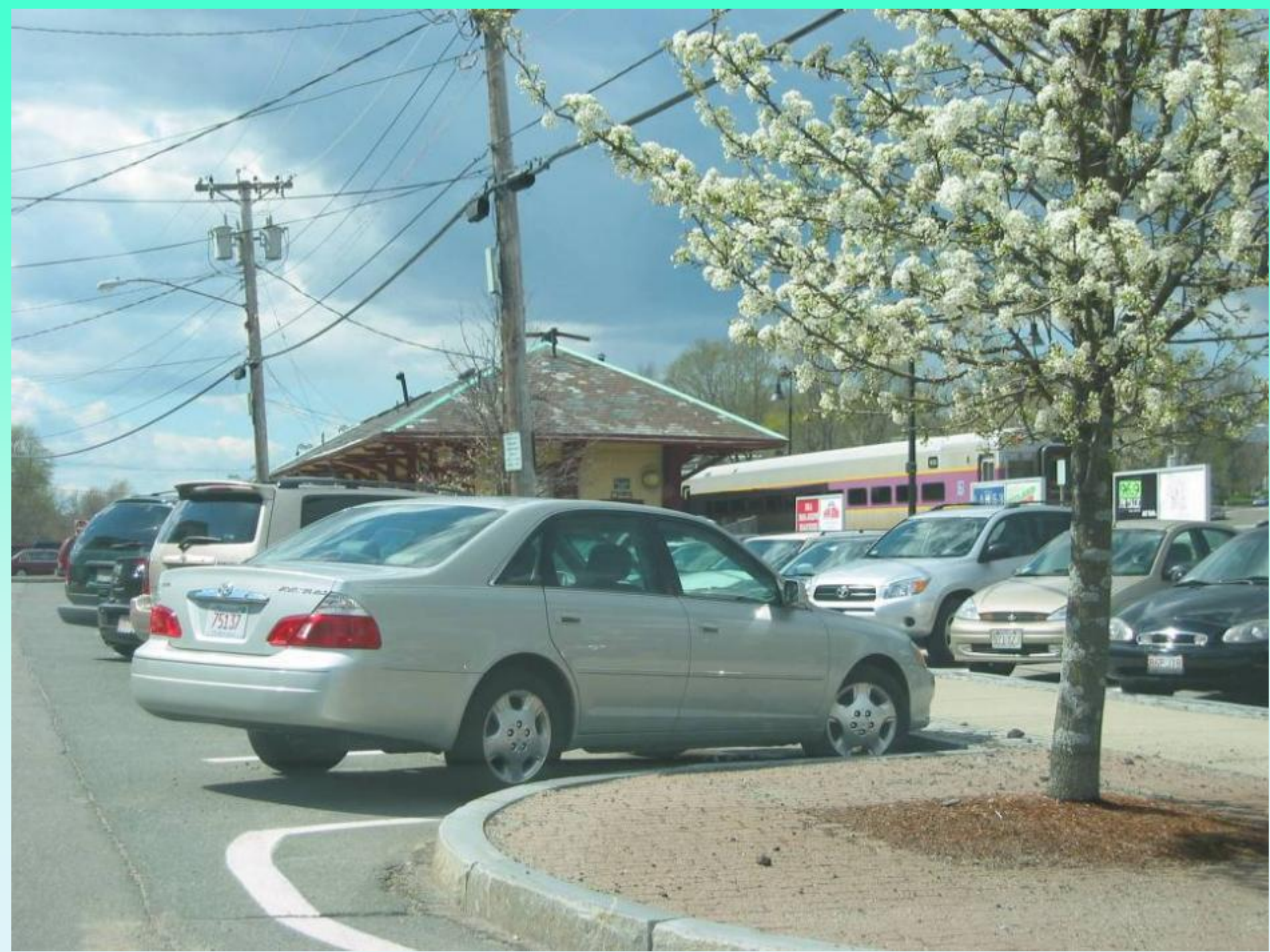


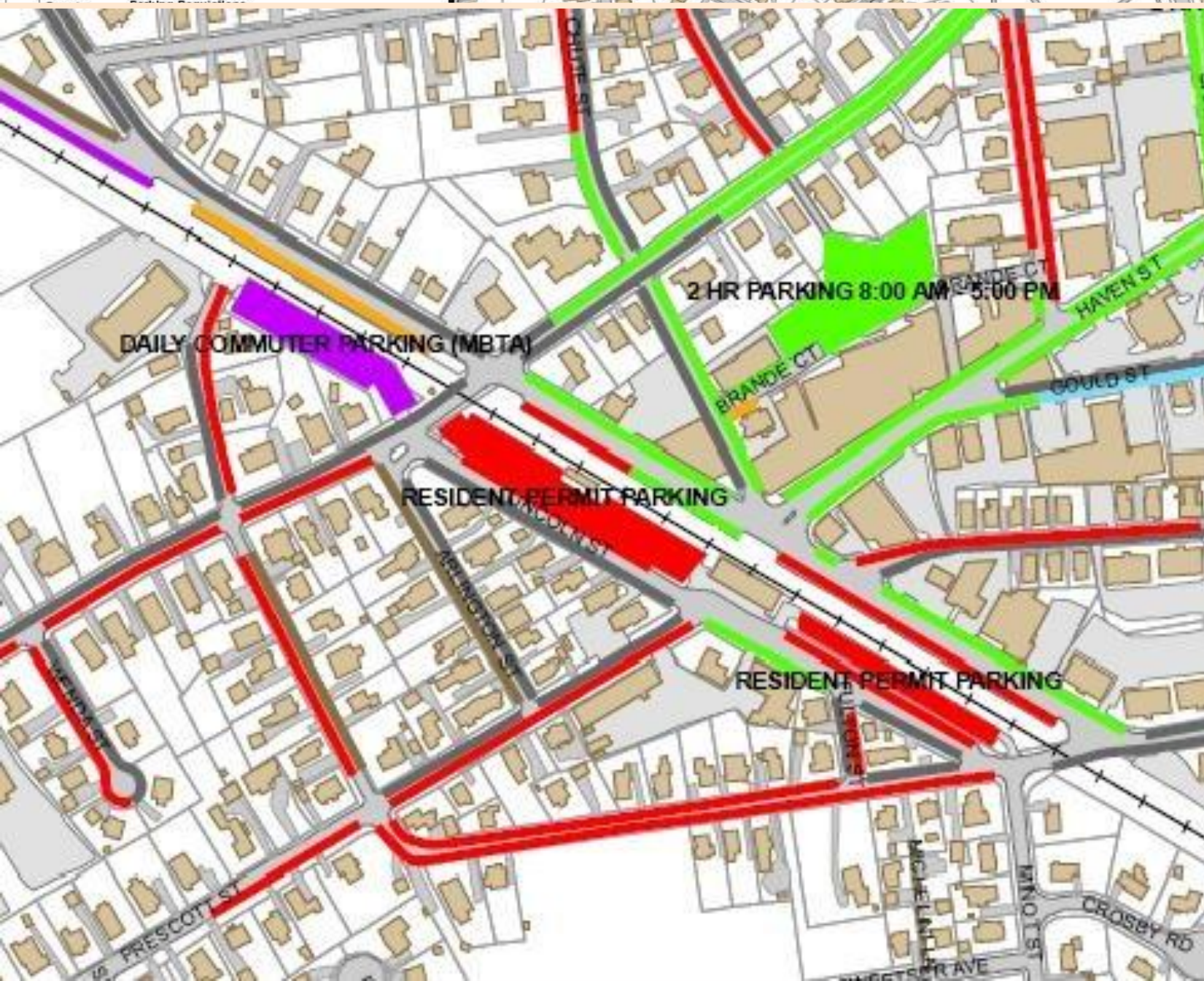
Image MassGIS, Commonwealth of Massachusetts EOE



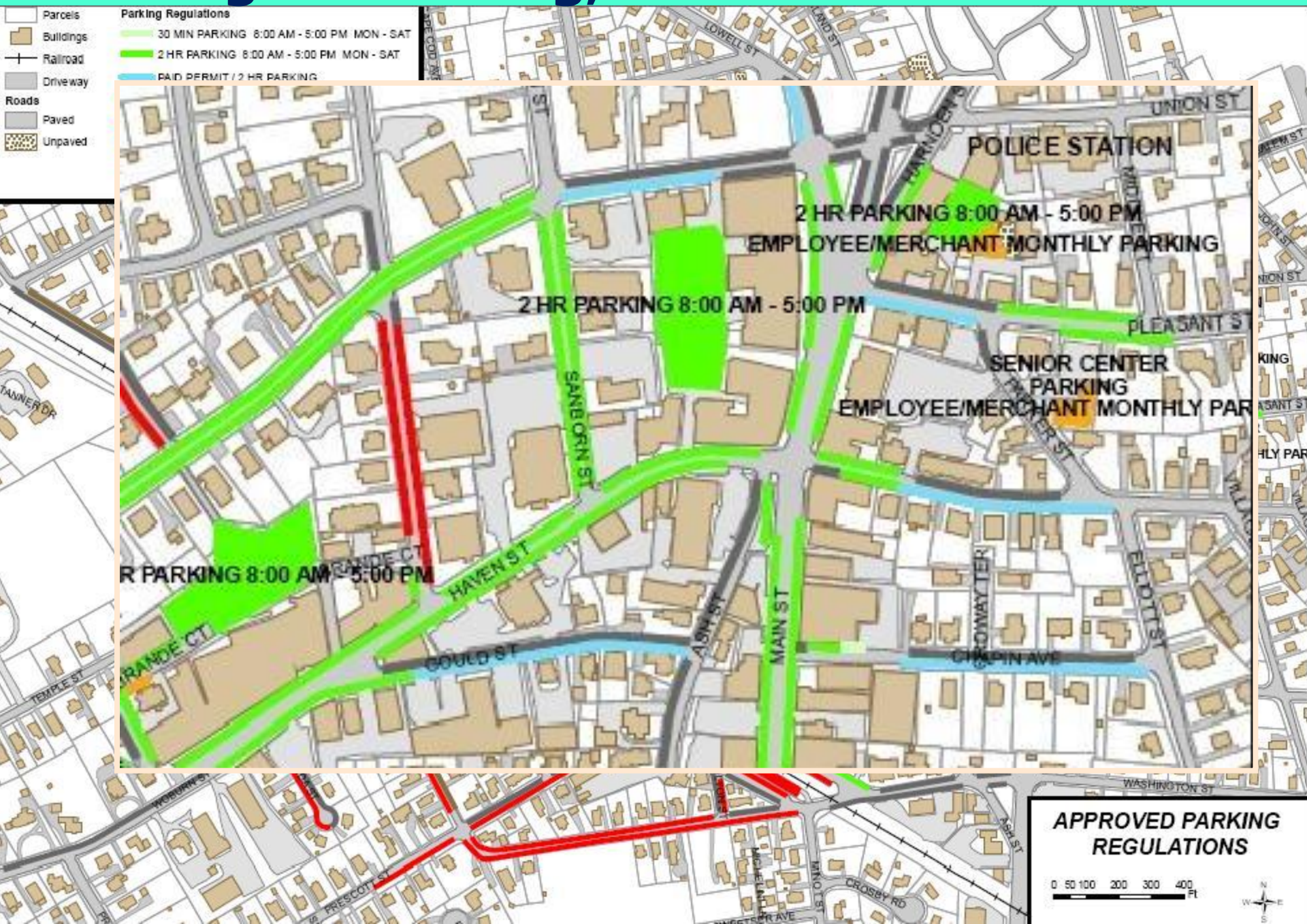




Parking in Reading, MA



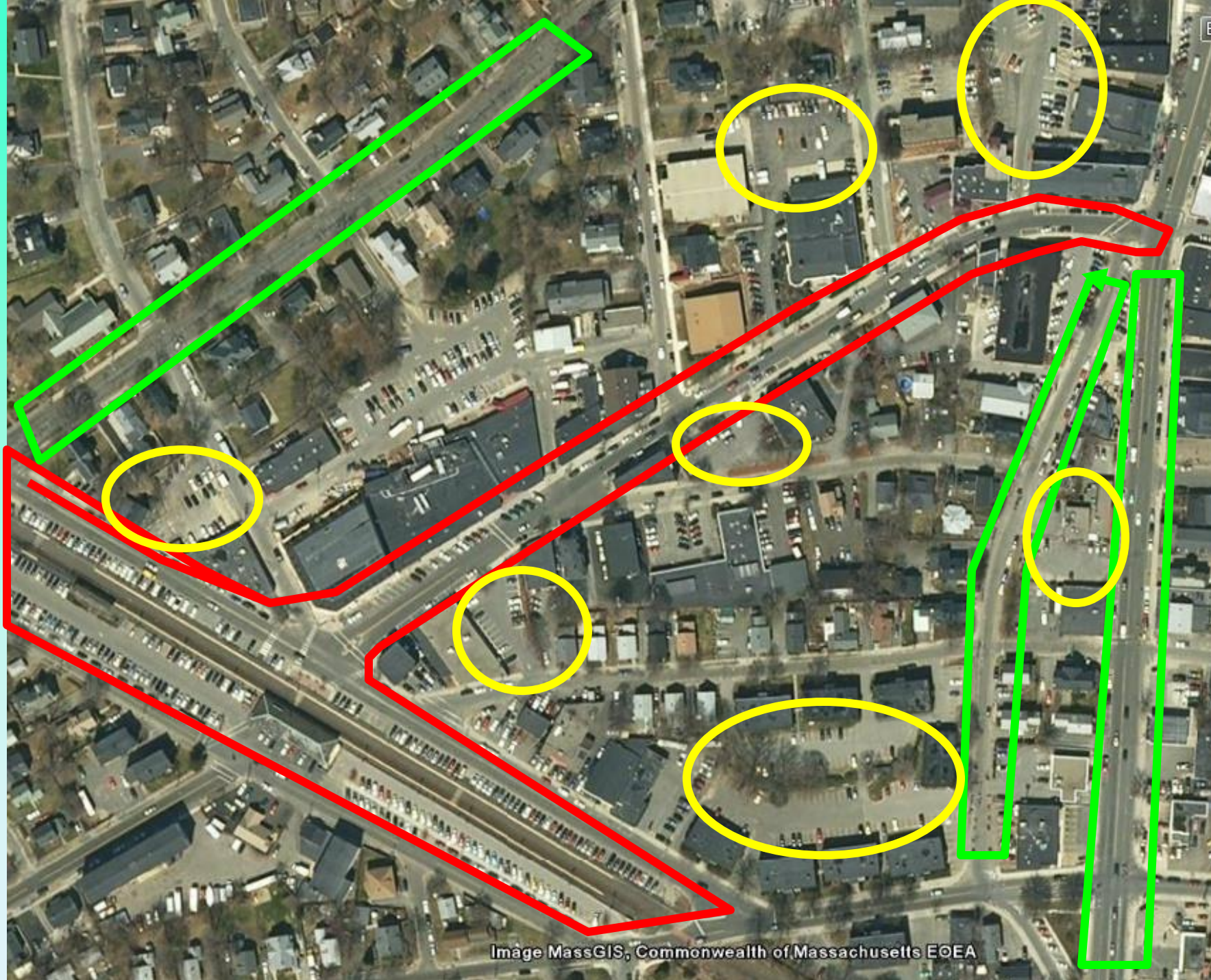
Parking in Reading, MA





Winter Overnight Parking Ban!
It shall be unlawful for the driver of any vehicle, other than one acting in an emergency, to park said vehicle on any street between the hours of 1:00am and 6:00am











PARKING
8:00 AM
TO
5:00 PM





CVS/pharmaco

READING
Trophy & Shirt

MIDDLESEX
ANIMAL HOSPITAL

SPACE AVAILABLE
617-413-3282

Parking Study Basics

- **Base inventory.** Either from aerials, city GIS, studies, or fieldwork. Include every on and off-street public and private space.
- **Route.** Define walking route with a map, assuming average person can do at least 1,000 spaces per hour (1,500 max).
- **Period.** Data should be collected during prime hours of activity, peak accumulation, and notable activity. Minimum of every 4 hours. Better every 2 hours.
- **Collection plan.** Based on route and period of collection, number of people can be calculated and data entry forms customized to route.
- **Collection protocol.** Enter number of vehicles parked in each field. Complete and return to start of route by beginning of next interval.
- **Reporting.** Color coded maps showing percentage utilization

Welcome, Mr. Matthew Cuddy!

Displaying Parking Information

Downtown Parking Study Reading, MA

On-Street Utilization

Over Capacity (100%+)

81% - 100%

61% - 80%

41% - 60%

21% - 40%

0% - 20%

Off-Street Utilization

Over Capacity (100%+)

81% - 100%

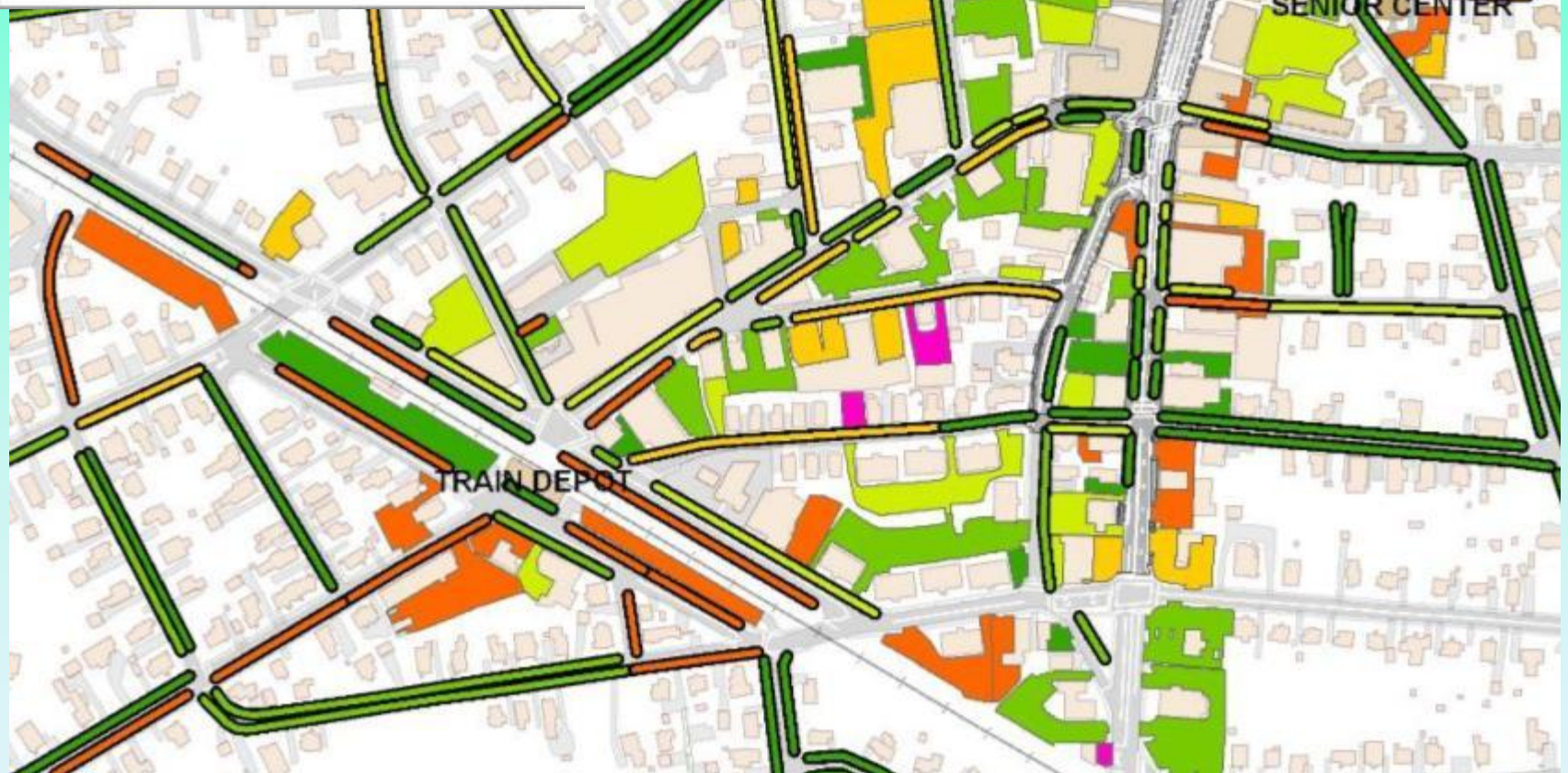
61% - 80%

41% - 60%

21% - 40%

0% - 20%

0 85 170 340 510 680 Feet



Downtown Parking Study Reading, MA

On-Street Utilization

Over Capacity (100%+)

81% - 100%

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Off-Street Utilization

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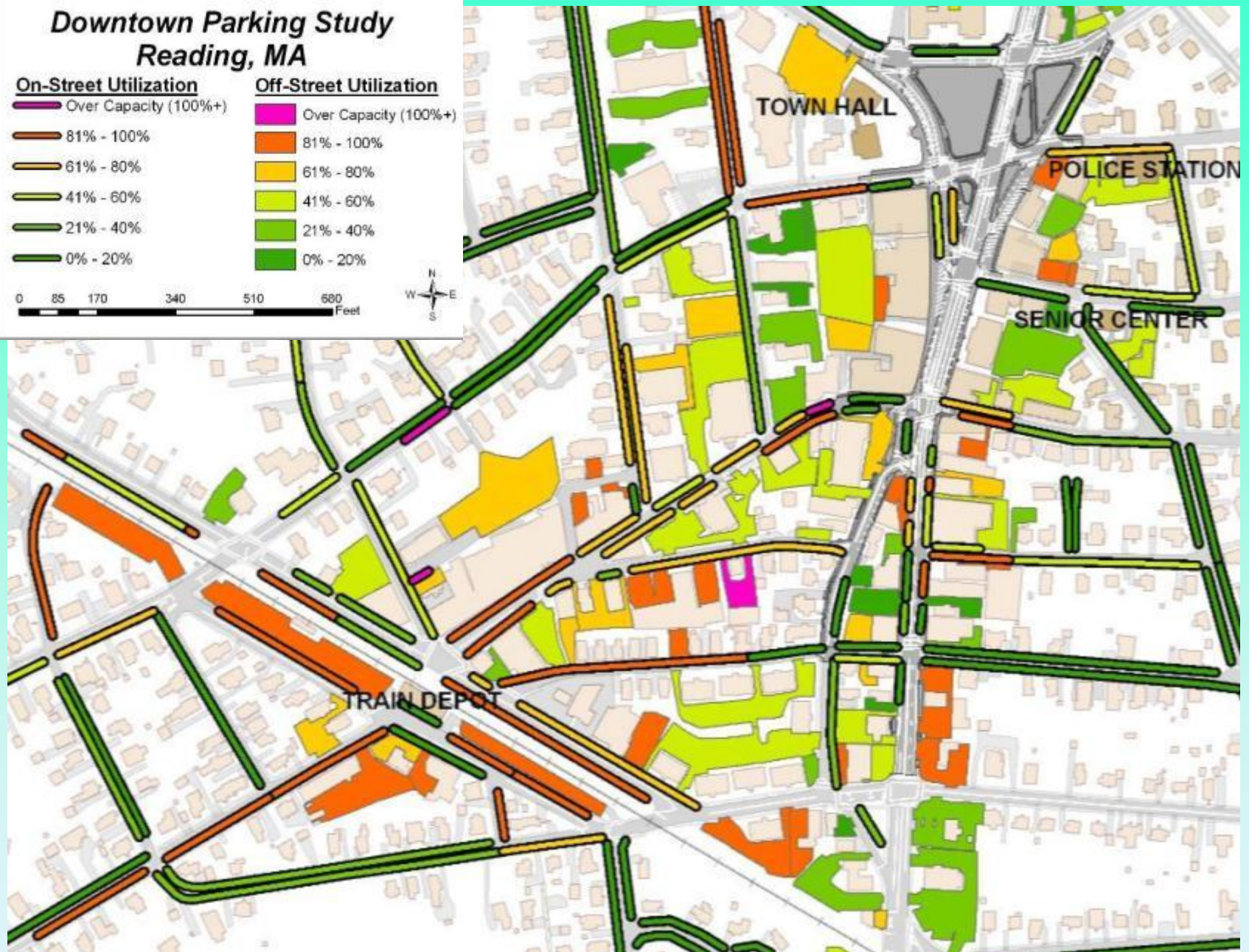
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0% - 20%

0 85 170 340 510 680 Feet



Downtown Parking Study Reading, MA

On-Street Utilization

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Off-Street Utilization

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81% - 100%

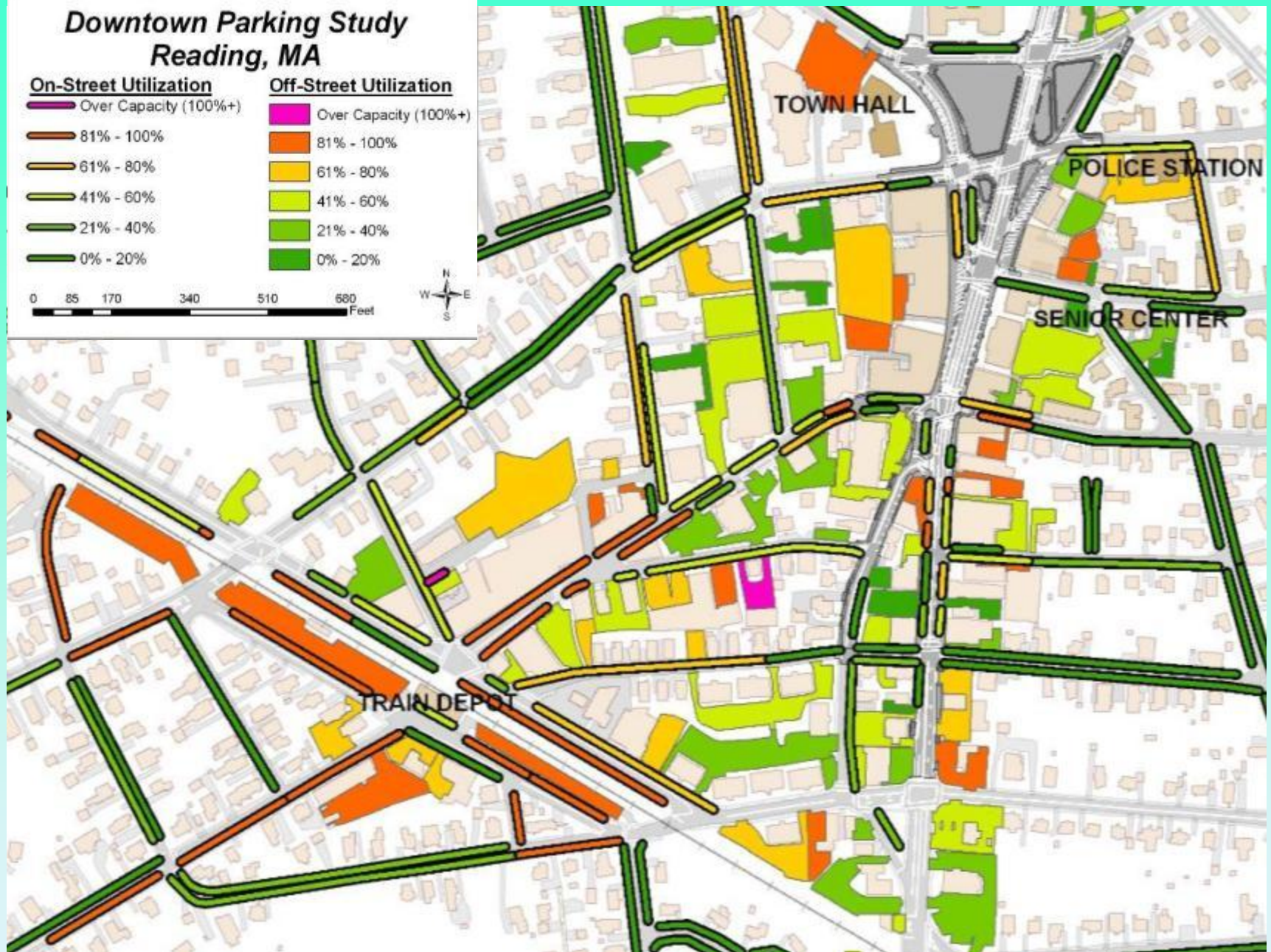
61% - 80%

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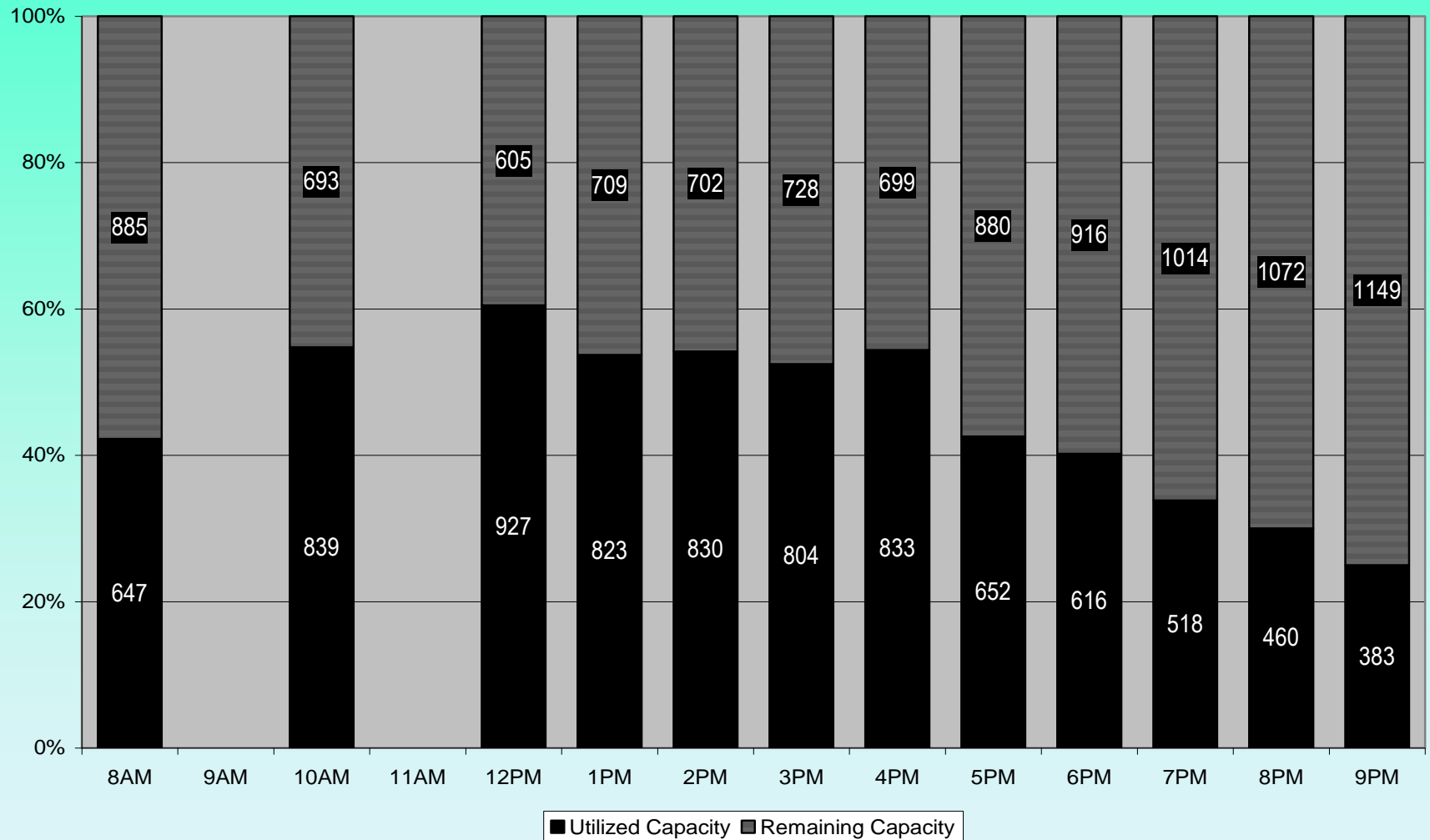
21% - 40%

0% - 20%

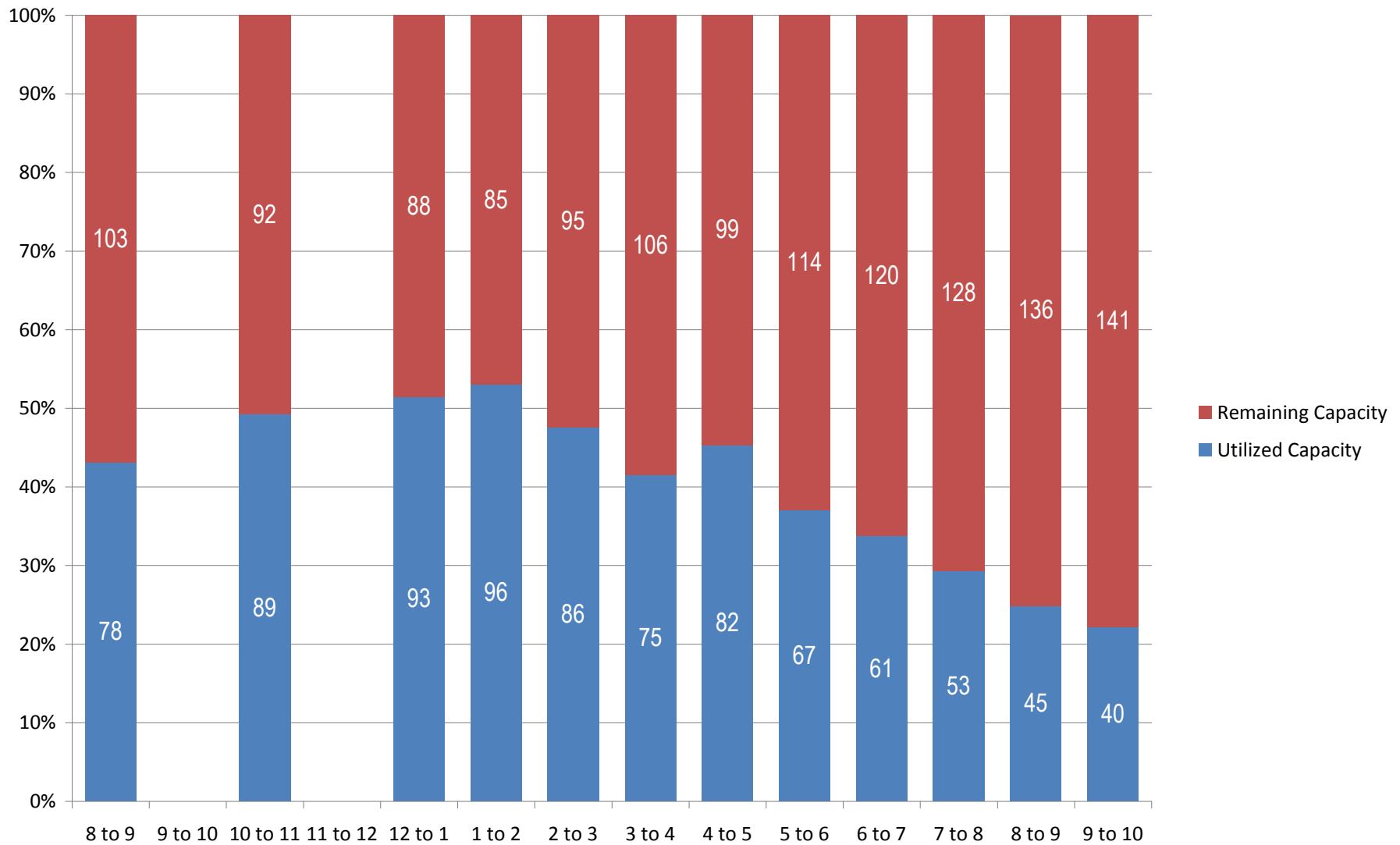
0 85 170 340 510 680 Feet



Downtown Core Weekday Utilization Profile



All Lots with Access to/from Haven Street



TURNOVER STUDIES



CVS/pharmacia

READING
Trophy & Shirt

MIDDLESEX
ANIMAL HOSPITAL

SPACE AVAILABLE
617-413-3282

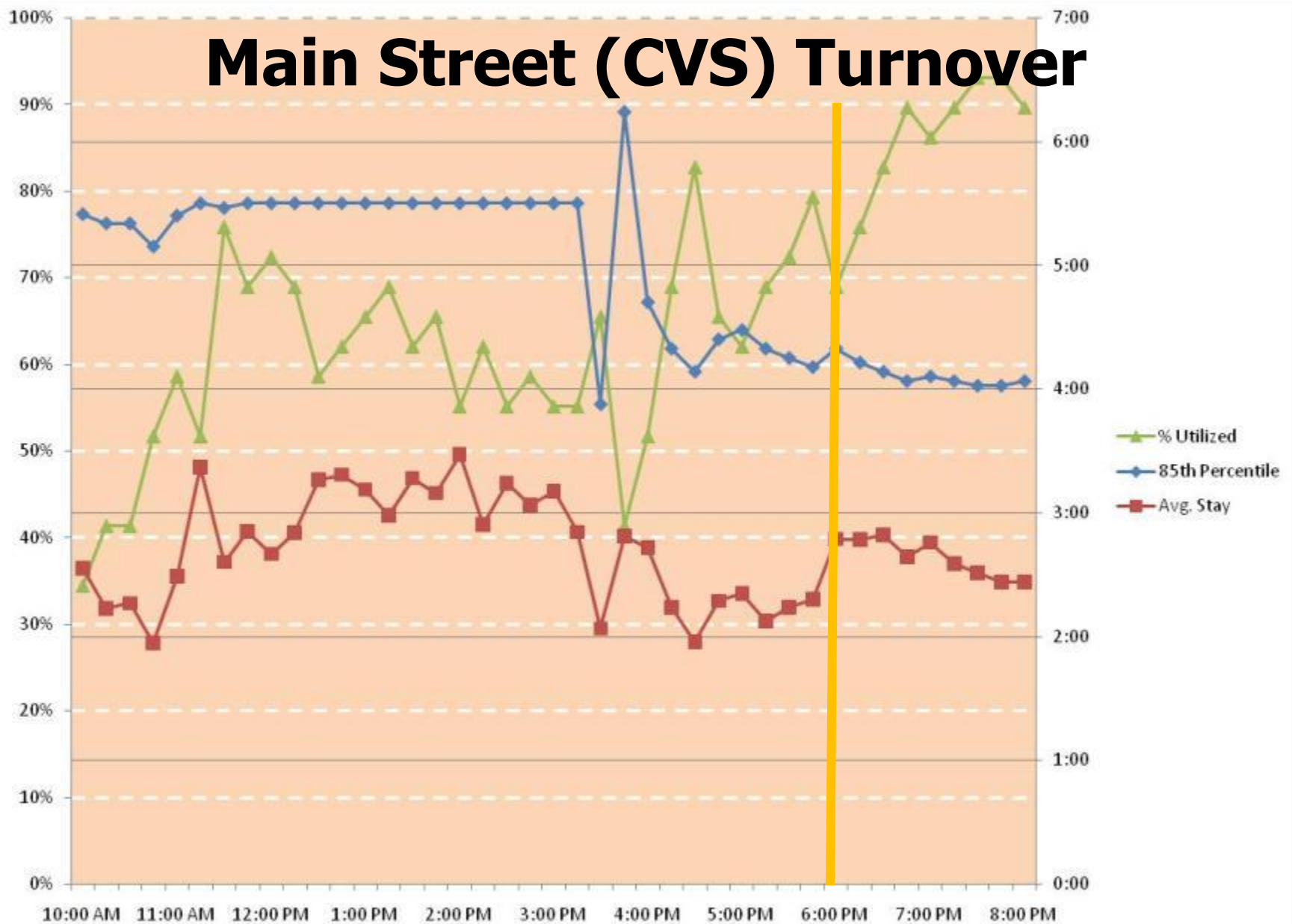


Turnover Study Basics

Chose Your Method

- **Detailed** – a Constant Observation Count:
 - One observer of entire field (limited by sight distance)
 - Record time in & out for each space
- **Increments** – License Plate Count:
 - Record license plates with each pass (15 min increments)
 - Bigger study area
- **Reporting.** Average turnover by time of day.

Main Street (CVS) Turnover

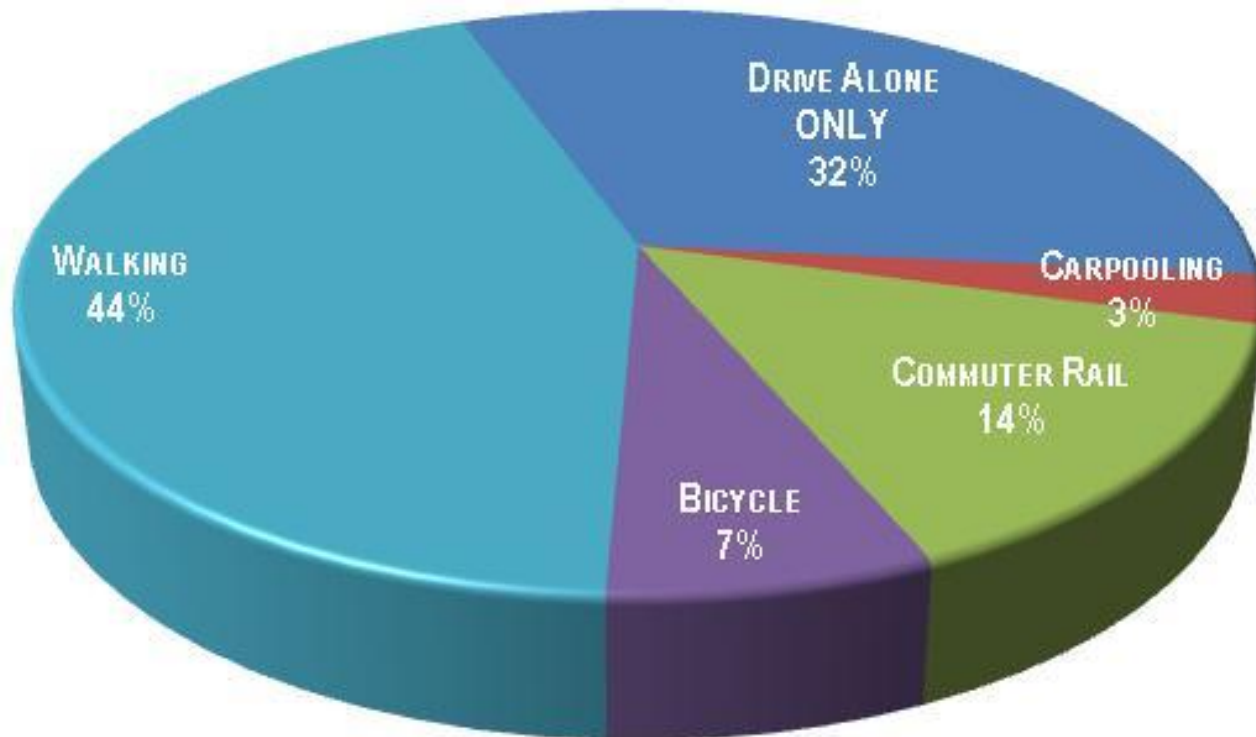


SURVEYS (& INTERVIEWS)

Typical Questions

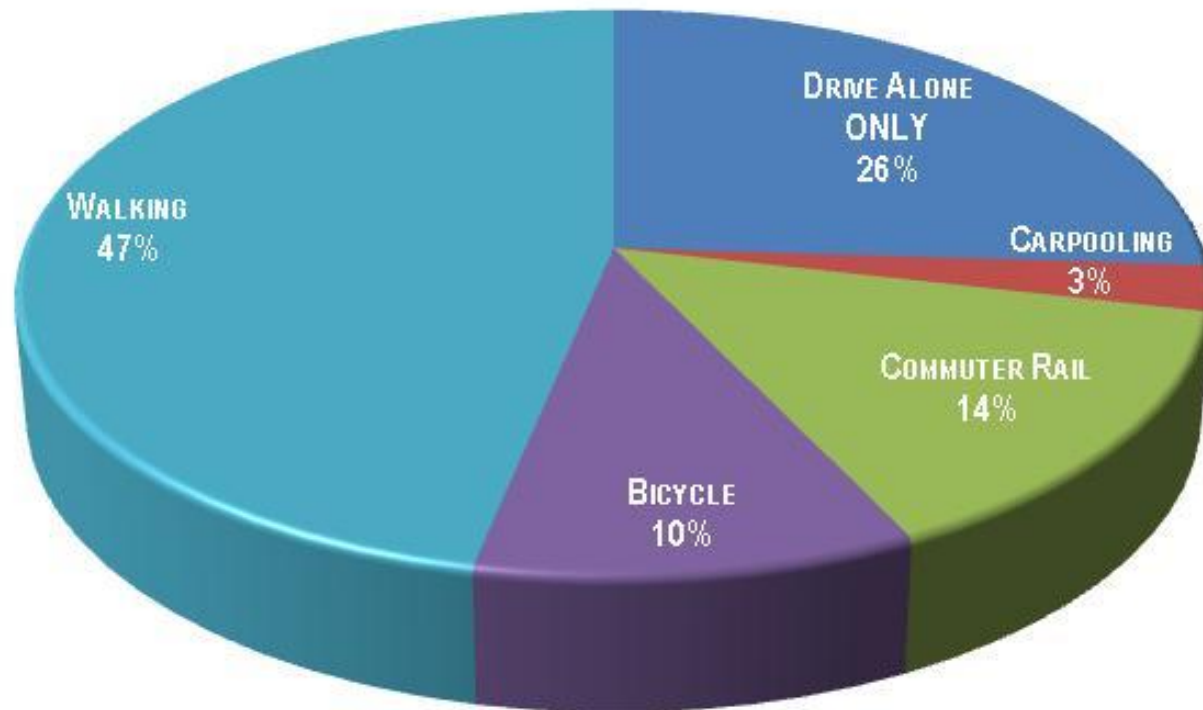
- *How many days each week do you travel downtown?*
- *What is your purpose for coming downtown today?*
- *If you ever use different means of travel for Downtown trips what other modes do you use? How many times per week?*
- *How long did it take you to find a spot today? _____ mins.*
- *How long will you be staying today? ____ hours _____ minutes*
- *What is your destination(s)?*
- *How close to your destination did you park?*
- *Do you always park in the same place or do you search?*
- *If you search, how long on average? _____ mins.*
- *Do you typically pay to park?*
- *How much? \$_____ . _____*

Do You Always Use a Car?

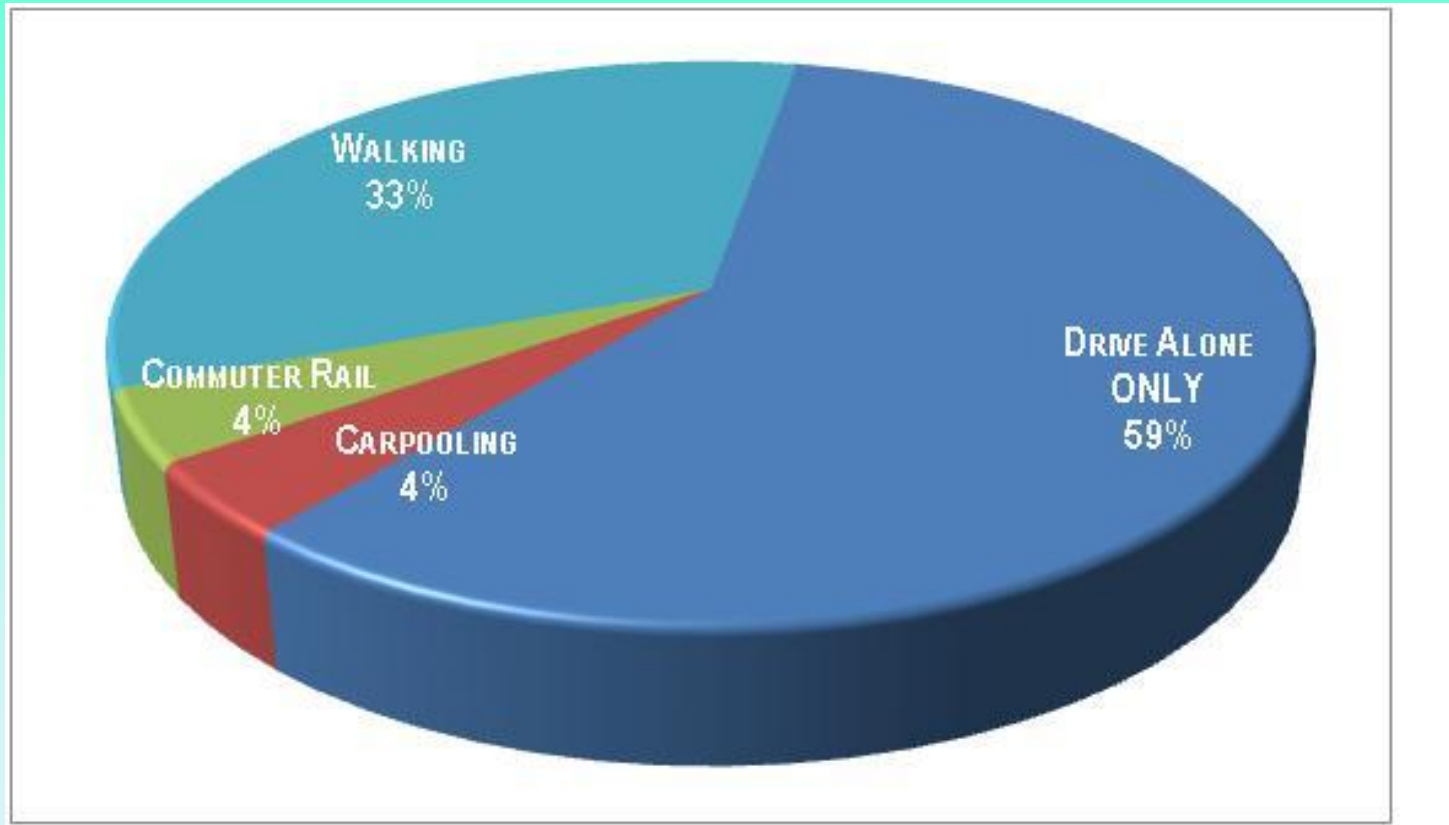


Do You Always Use a Car?

Visitors



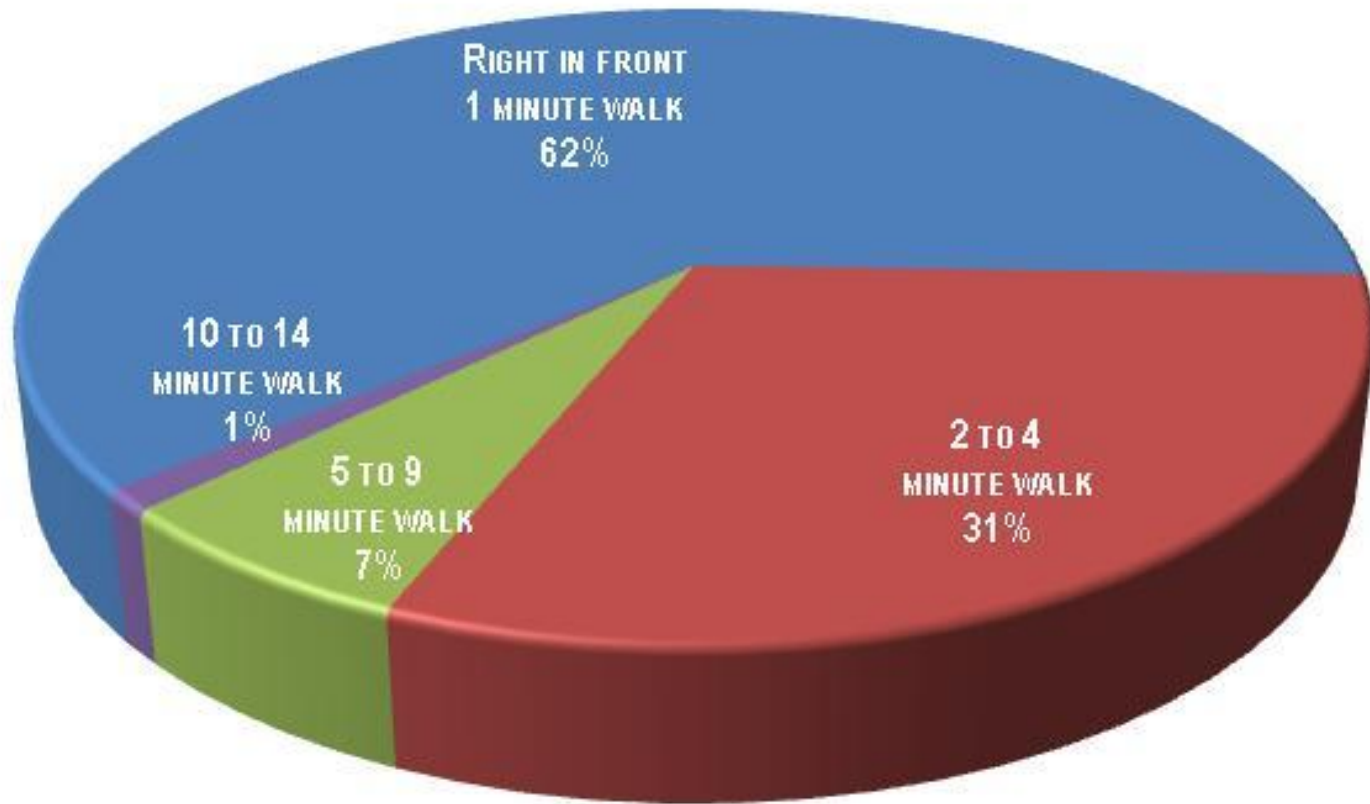
Do You Always Use a Car? Workers



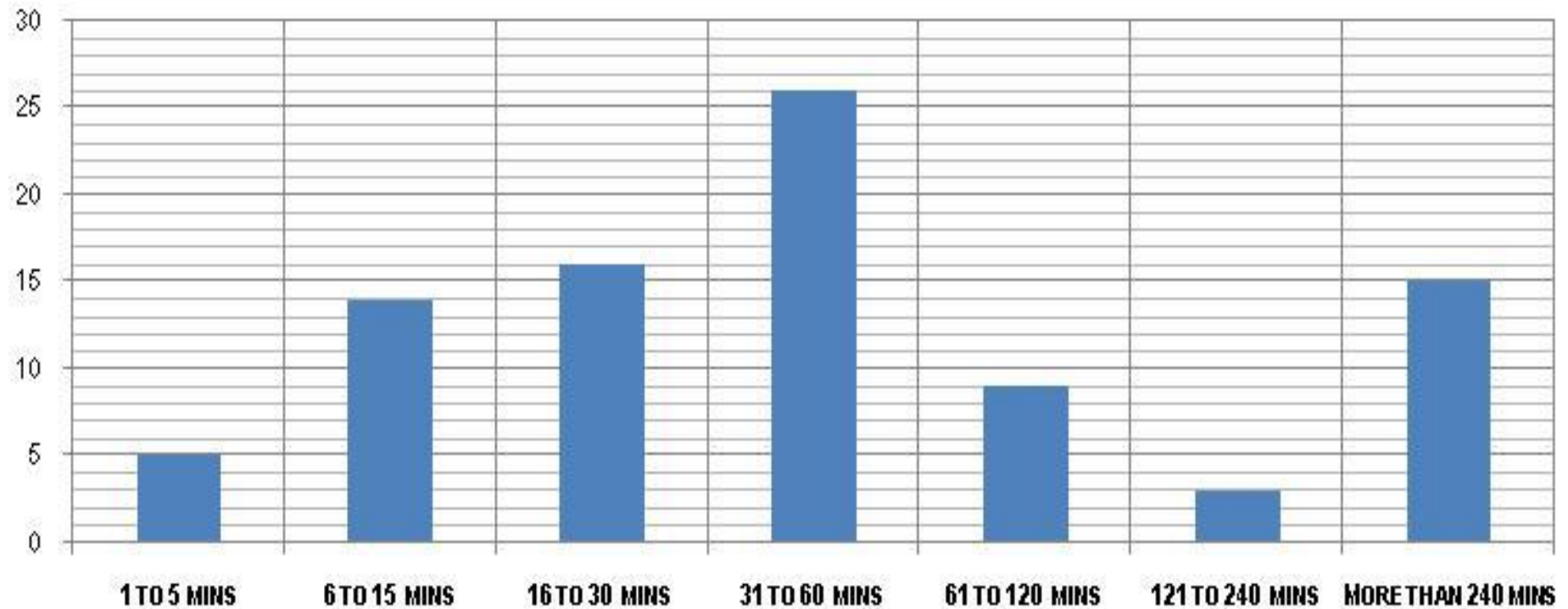
Why Do You Park Where You Park?



Where Do You Find a Space?



How Long Do You Park?



Parking Studies

- Be comprehensive
 - Anywhere you can think to park, so will someone else
- Don't ignore the problem
 - Collect data at night and on weekends
- Surveys are essential
 - But DO NOT rely on their data exclusively
- Plan well
 - Good maps, realistic expectations
- Reporting
 - Data tells a thousand words – if it makes sense. Use graphics.
- Level of effort
 - These are easy, even with volunteers

Involve the Community



Questions? Ideas? Discussion?

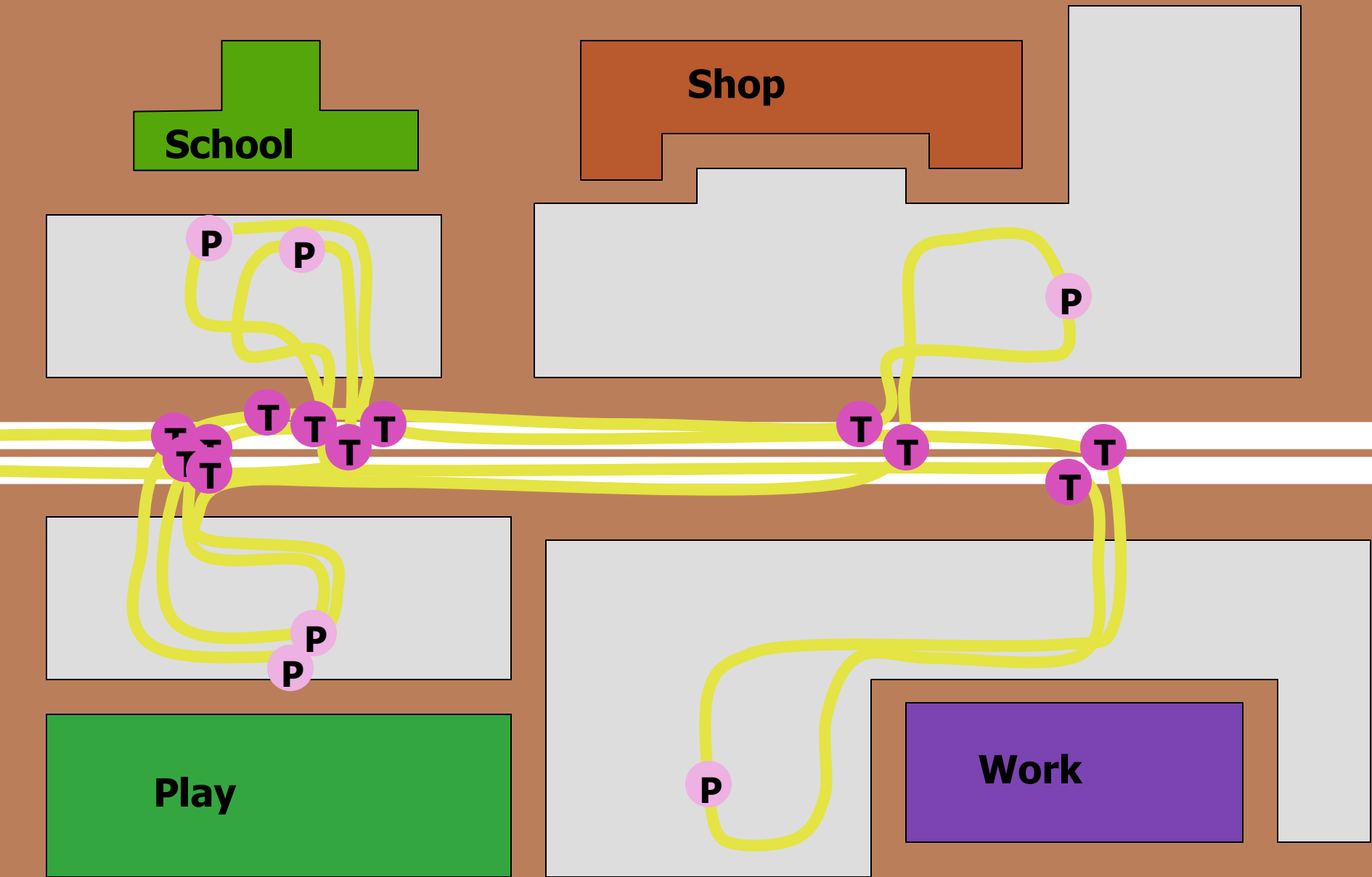


Session 3

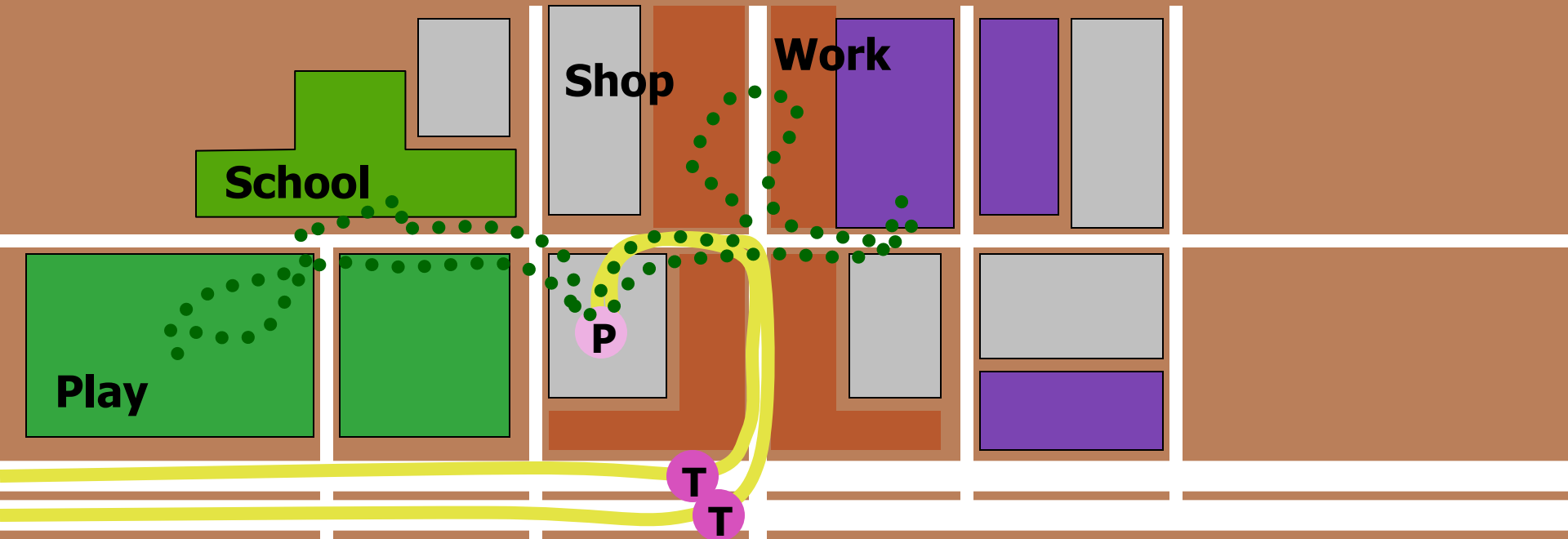
ZONING STRATEGIES

SHARED PARKING

Conventional Development



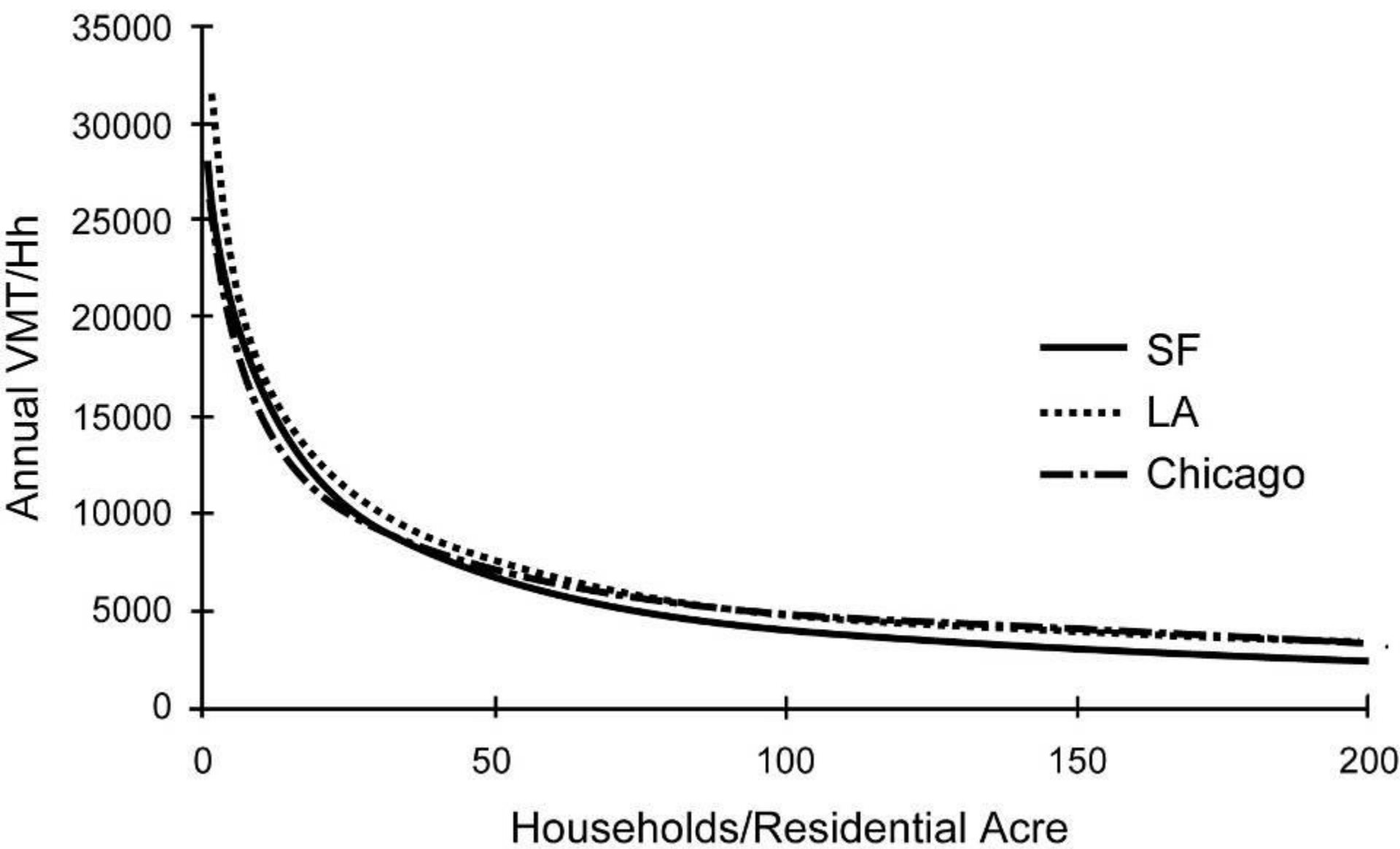
Mixed Use, Park Once District



Results:

- $< \frac{1}{2}$ the parking
- $< \frac{1}{2}$ the land area
- $\frac{1}{4}$ the arterial trips
- $\frac{1}{6^{\text{th}}}$ the arterial turning movements
- $< \frac{1}{4}$ the vehicle miles traveled

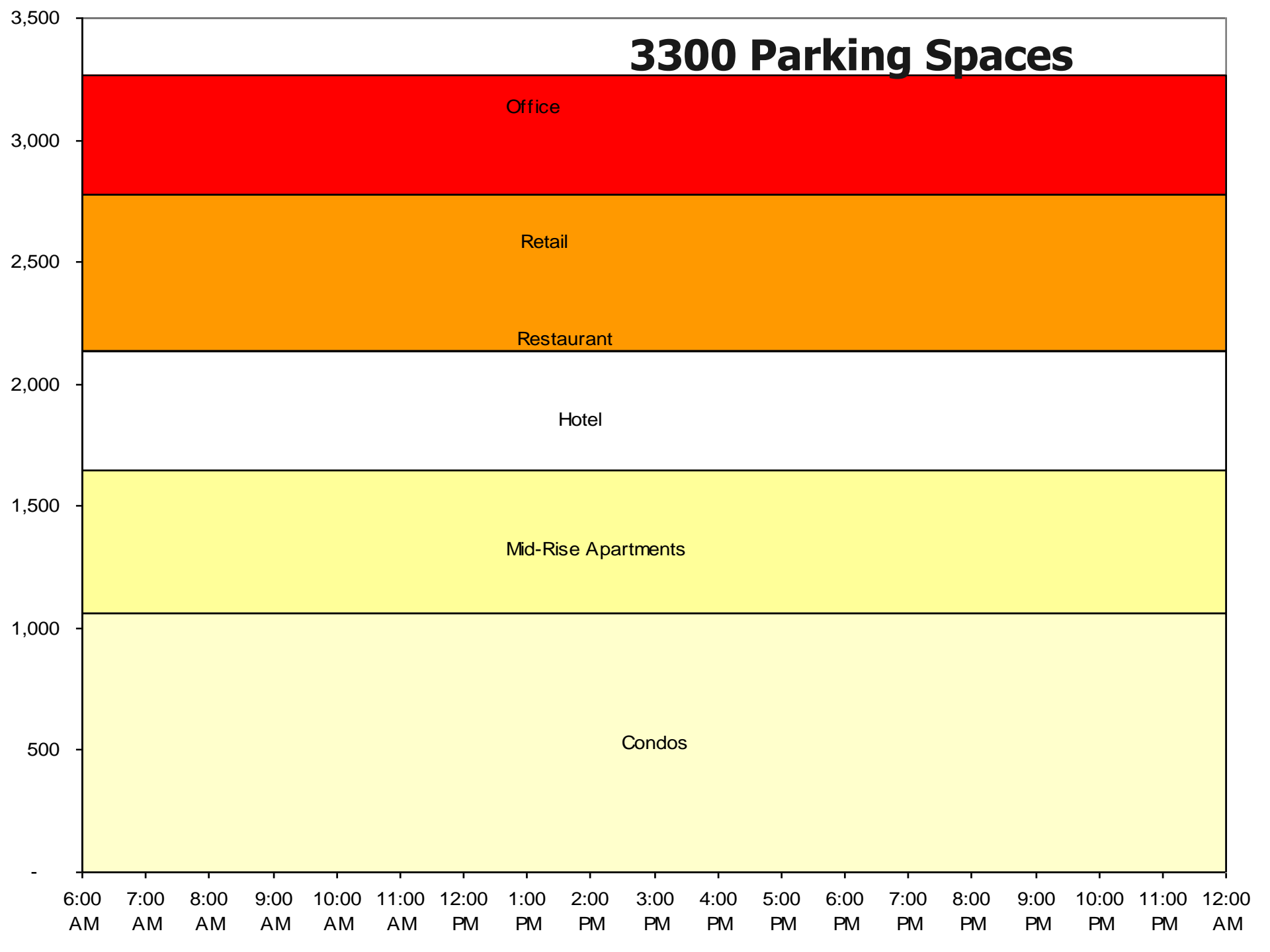
Driving vs Residential Density



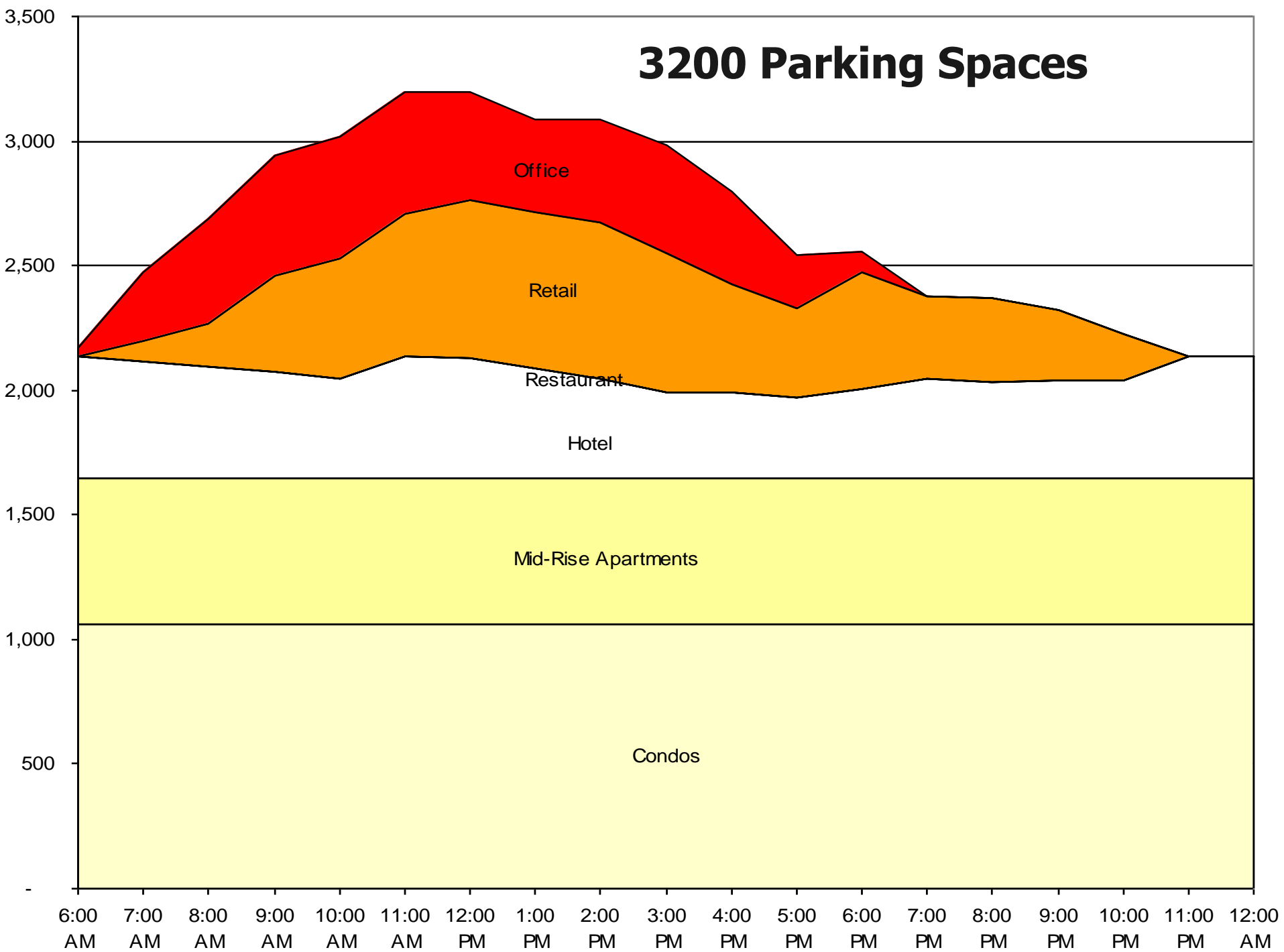
Shared Parking Principles:

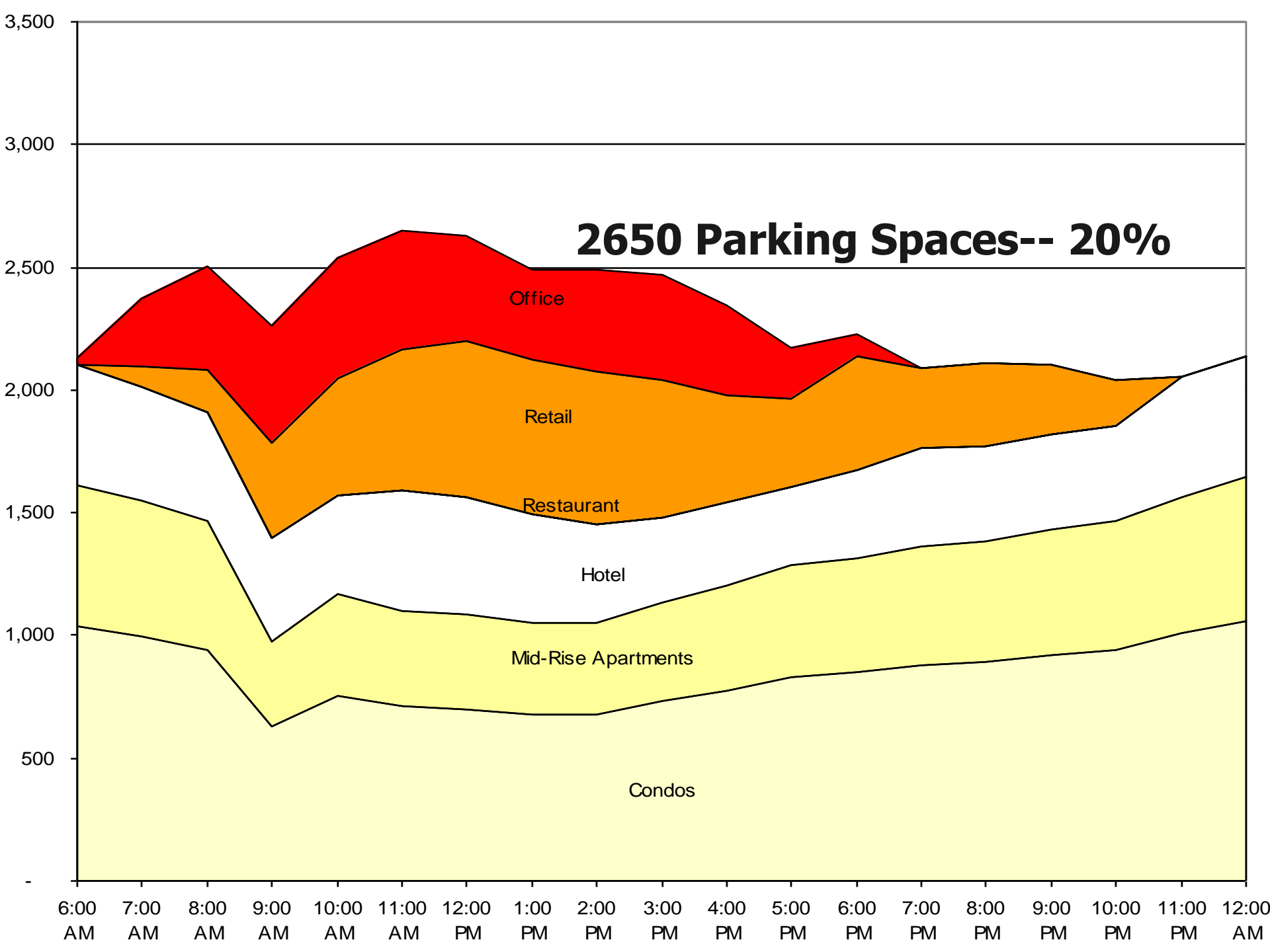
- Permit a developer to provide less than the minimum parking normally required if two or more uses have peak demand at different times of day or day of week
 - e.g. office peak demand M-F 9AM-5PM; housing peak demand 6PM-8PM.

3300 Parking Spaces



3200 Parking Spaces





Shared Parking Advantages:

- Improves efficiency of use of existing parking supply
- Reduces localized congestion
- Leaves room for more intensive use of saved space
- Supported by Massachusetts law

Shared Parking

Marlborough

- Zoning code permits uses to share parking resources if their peak demand periods are different
- Developers can reduce parking obligation by up to one half of what it would be for the two uses separately



Shared Parking

Marlborough

- Shared parking policy has reduced parking supply for certain projects by 50%
- Produced an overall parking supply reduction estimated at 20%



Waltham

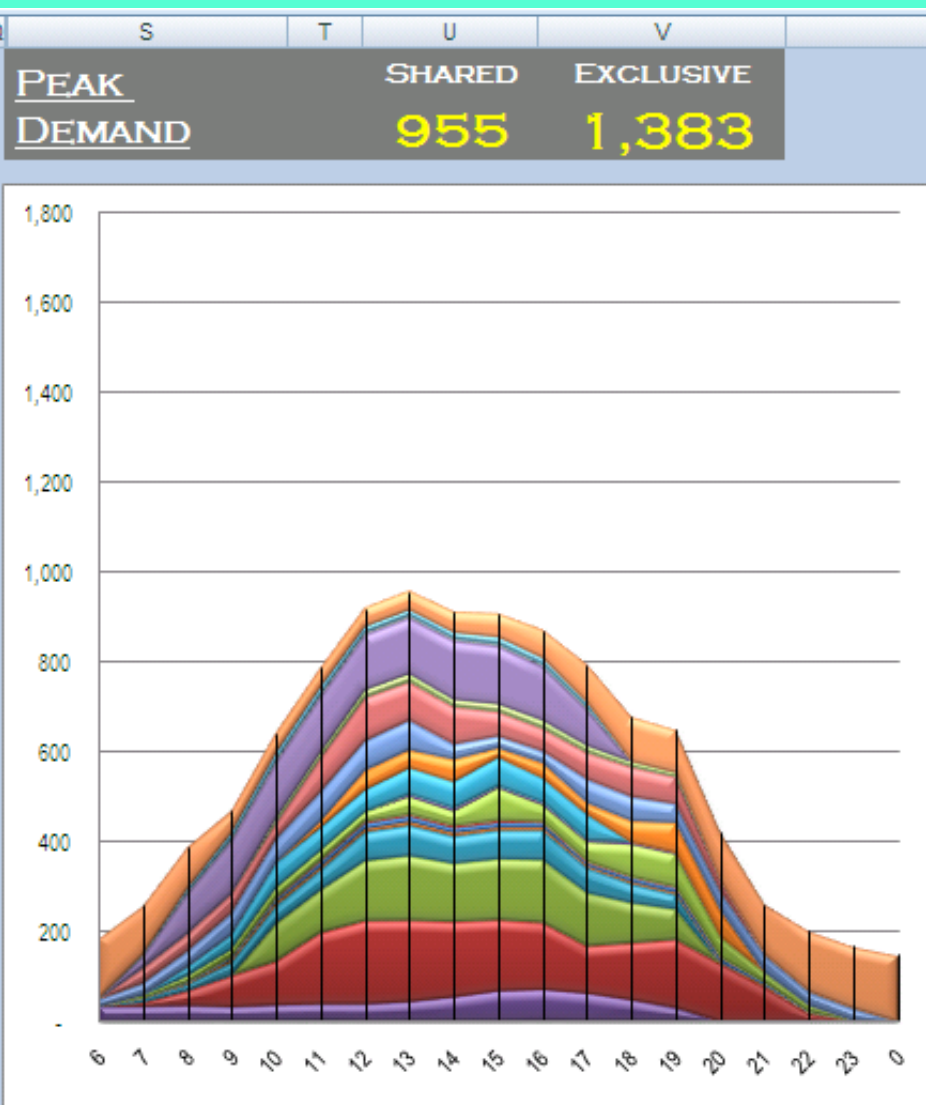
Formula for Mixed-Use Parking Credit

	Weekday			Weekend	
	Night	Day	Evening	Day	Evening
	Midnight-7AM	7AM-5PM	5PM-Midnight	6AM-6PM	6PM-Midnight
Residential	100%	60%	90%	80%	90%
Office/Industrial	5%	100%	10%	10%	5%
Commercial retail	5%	80%	90%	100%	70%
Hotel	70%	70%	100%	70%	100%

- Multiply the normal requirement for each use by the percentage
- Sum the values for each column
- Highest column total is the effective requirement

ULI Shared Parking Model

	B	C	E	F
1	DOWNTOWN CORE			
2	ONLY EDIT BLUE CELLS			
3	Land Use	Weekday Rate	Square Feet	Units
4	RETAIL/RESTAURANT			
5	Mini-Warehouse	0.16	16,838	square feet
6	Athletic Club	3.55	21,817	square feet
7	Shopping Center	2.65	78,615	square feet
8	Tire Store	4.17	39,120	square feet
9	Supermarket	2.27	33,769	square feet
10	Convenience Market	3.40	2,804	square feet
11	Liquor Store	2.98	4,400	square feet
12	Apparel Store	1.13	5,150	square feet
13	Pharmacy/Drug Store	2.02	42,001	square feet
14	Carpet Store	1.33	4,900	square feet
15	Drive-In Bank	2.78	26,920	square feet
16	Quality Restaurant	15.40	5,000	square feet
17	High Turnover Restaurant	5.55	13,550	square feet
18	Fast Food	9.90	11,130	square feet
19	Dry Cleaners	1.40	15,512	square feet
20	OFFICE			
21	Office	2.40	70,242	square feet
22	Medical/Dental Office	3.53	6,860	square feet
23	RESIDENTIAL			
25	Low to Mid Rise Apartment	1.00	182	units

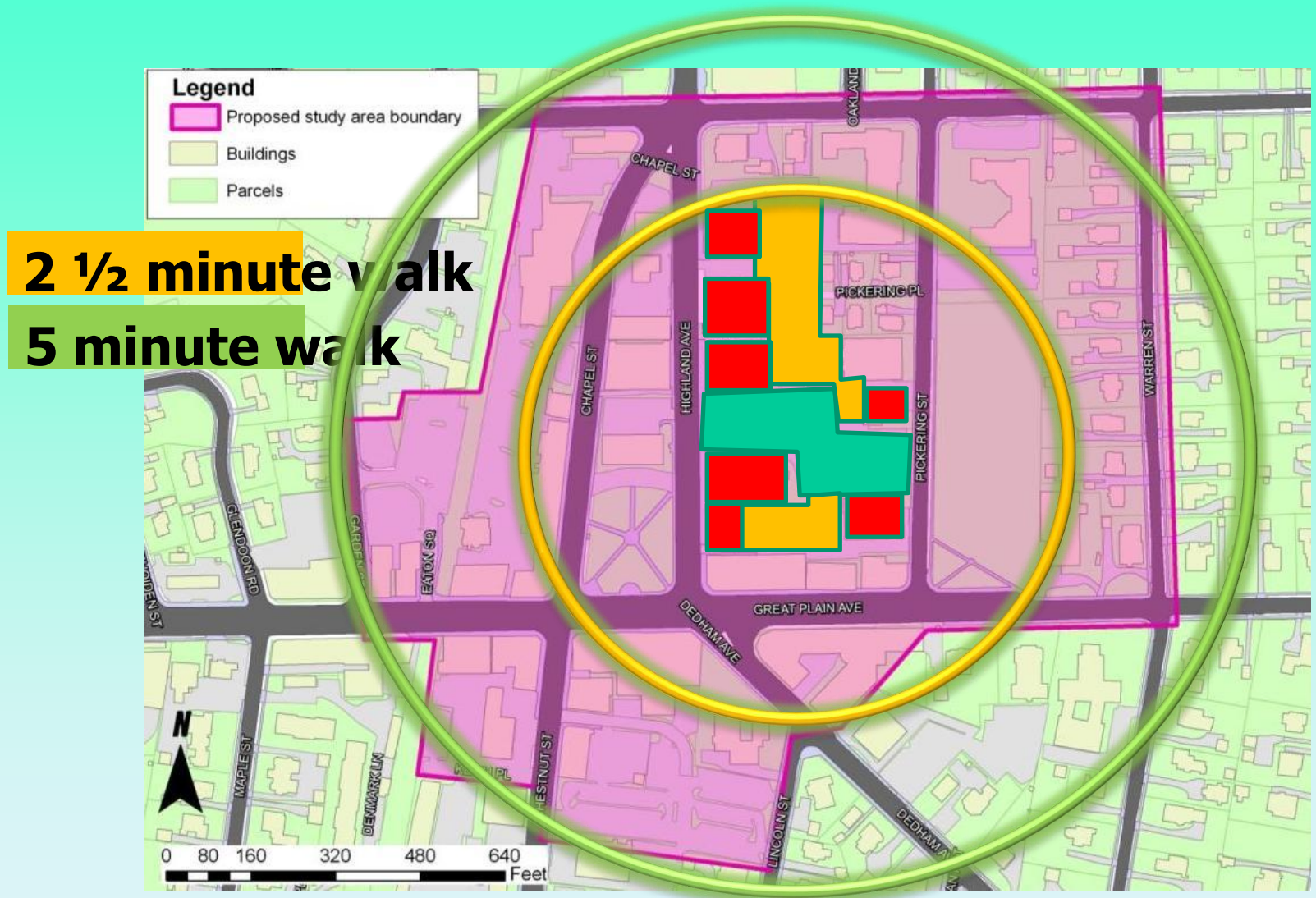


Needham, MA: Shared Parking Pilot

- Lack of parking for Town Hall staff/visitors
- Desire to build an Annex
- Desire to improve Walgreens lot operations & appearance
















Needham, MA: Shared Parking Pilot



Needham, MA: Shared Parking Pilot

Parking Management Regulations

	2 Hour Meter
	2 Hour Parking
	Buddy
	Commuter Permit
	Customer
	Employee
	Newton Wellesley Primary Care
	No Parking
	No Parking 7am-4pm
	Private
	Senior Center
	Tenant
	Walgreens
	Walgreens (with 8 Reserved)



Needham, MA: Shared Parking Pilot

Parking Management Regulations

- 2 Hour Meter
- 2 Hour Parking

Employee



Needham, MA: Shared Parking Pilot

Parking Management Regulations

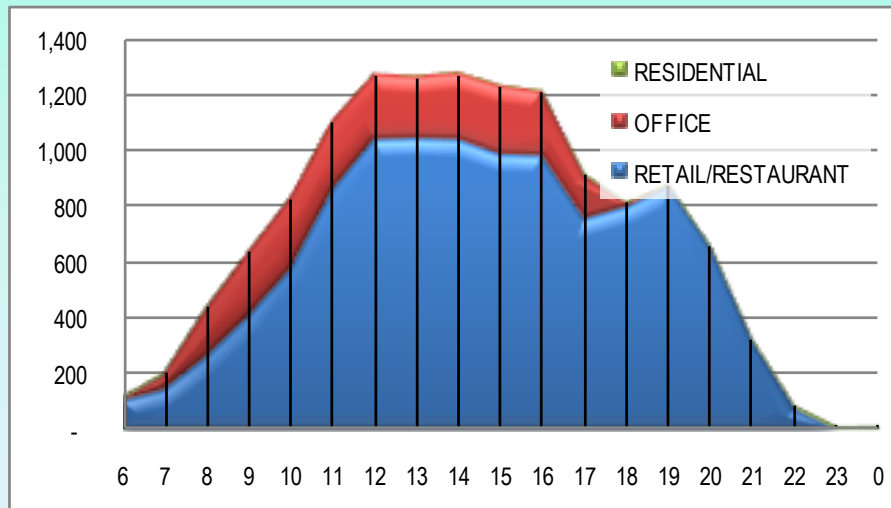
- 2 Hour Meter
- 2 Hour Parking

Employee



Sharing Existing Spaces

1. Town leases parking from landowners
2. Town increases supply:
 - Elimination of barriers allows more efficient flow: as low as 325 SF/space = 428 spaces (currently 273)
 - Natural shared parking benefits



Sharing Existing Spaces

1. Town leases parking from landowners
2. Town is able to increase supply up to 50%
3. Town sells employee permits and sub-leases spaces new development
4. New Town revenues

REMOTE PARKING

Principles of Remote Parking

- In areas of high demand, people will walk to parking – especially employees
- Typical 300-foot accessory parking radius is arbitrary
- Must haves:
 - No other easy option
 - Viable connection (ideally by foot)
 - Captive market

Remote Parking

Stoneham

- For CBD uses and certain uses in Commercial I district:
 - Allows off-site parking to meet requirements if within 600' (clientele) or 1,200' (employees), regardless of time of day of use
 - Provision of a shuttle service can eliminate the distance limitation
 - Permits substitution of spaces in municipal lots within 1,600'
 - Combined with shared parking provision that allows 50% reduction for uses peaking at different times of day

Remote Parking

Rockport

- Free Park-and-Ride lot on the outskirts of town with a free shuttle to downtown





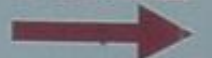
VISITOR
PARKING



Welcome
TO
Rockport

Park N Ride

PARK
FREE







REDUCED PARKING MINIMUMS

Reduced Minimums Governance

- Outright reduction in zoning
- Options where zoning rewrite is difficult:
 - 1) Incorporate provisions into the existing zoning code allowing reductions to be taken in certain zoning districts (ex: Stoneham, Waltham)
 - 2) Enact a Smart Growth Overlay District (MGL Chapter 40R) wherein developments may apply for a waiver of a portion of required parking (ex: 27+ MA communities)

Reduced Downtown Parking

Middleborough

- No downtown residential parking requirements for units above retail within ¼ mile of overnight public parking
- Secured 4 Housing Development Support Grants producing 25 downtown affordable housing units
- Increased tax revenue from more housing
- Increased business revenue for building owners who lowered their retail rent
- Increased property value

Reduced Downtown Parking

Ipswich

- No parking requirements for development within the CBD
- No parking requirements for development within 500 feet of municipal parking lots





Reduced Downtown Parking

Gloucester

- No residential off-street parking requirements for units above retail in the Central Business Zoning District
- No off-street parking requirements for businesses or municipal uses less than 10,000 sq. ft. built after 1990, within 400 feet of municipal parking



Reduced Downtown Parking

Stoneham

Stoneham, MA Zoning Code, Section 6.3.8.1 (relating to CBD uses and certain uses in Commercial I district):

3. ***Pedestrian access:*** Any proposals submitted, which, in the opinion of the Planning Board, provide direct and vital pedestrian access to other abutting commercial properties and serve to improve pedestrian accessibility may reduce the number of parking spaces required by **fifteen percent (15%)**. Pedestrian access shall be provided enough improved pathways, stairway access or other physical improvements, and such access shall be clearly marked.

Where can these principles apply?

Successful precedents: reviving neighborhoods by abolishing minimum parking requirements:

- Coral Gables, FL
- Eugene, OR
- Fort Myers, FL
- Fort Pierce, FL
- Great Britain
(entire nation)
- Los Angeles, CA
- Milwaukee, WI
- Olympia, WA
- Portland, OR
- San Francisco, CA
- Stuart, FL
- Seattle, WA
- Spokane, WA
- Ventura, CA

Where can these principles apply?

	SOV	Transit
• Pittsburgh, PA	32%	45%
• San Francisco, CA	39%	39%
• Madison, WI	71%	5%
• Phoenix, AZ	72%	20%
• Indianapolis, IN	74%	6%
• San Antonio, TX	80%	3%
• Winston-Salem, NC	90%	8%
• Greenville, SC	99%	0.5%

Source: TCRP Report 95, Traveler Response to Transportation System Changes, Chapter 18: Parking Management & Supply

PARKING MAXIMUMS

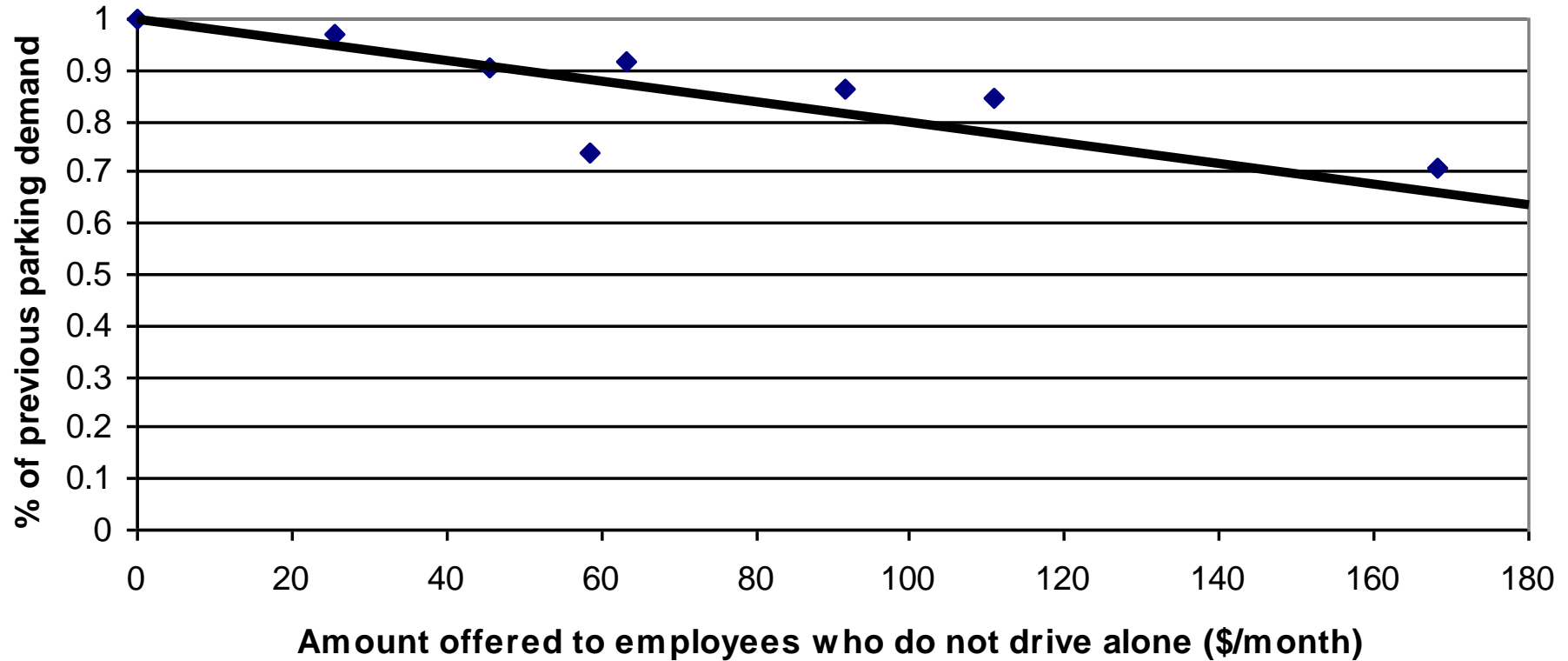
Parking Maximums



- Promotes alternatives to the private automobile
- Can tackle congestion if related to roadway capacity or mode shift goals
- Maximizes land area for other uses
- Appropriate in areas with strong real estate market where priority is to minimize auto dependence
- Examples: downtown San Francisco, Portland, Cambridge

PARKING CASH OUT & UNBUNDLING

Parking Cash-Out: Results



Employee Transportation Benefit

Drive Alone: \$148



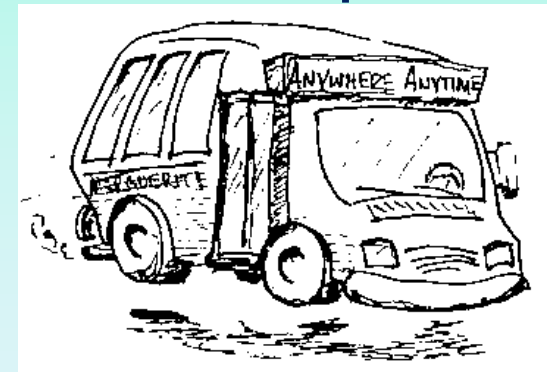
Carpool: \$0



Bike/Walk: \$0



Transit: \$0



Employee Benefits After Cash-Out

Drive Alone: \$148



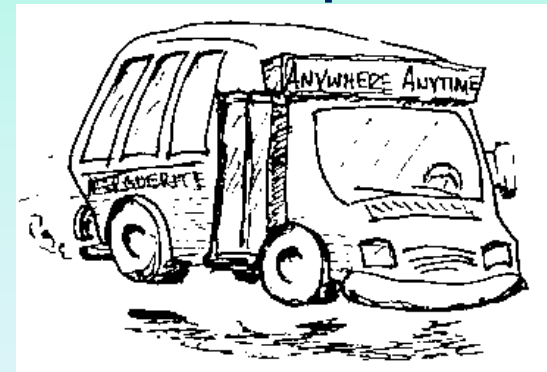
Carpool: \$148



Bike/Walk: \$148



Transit: \$148



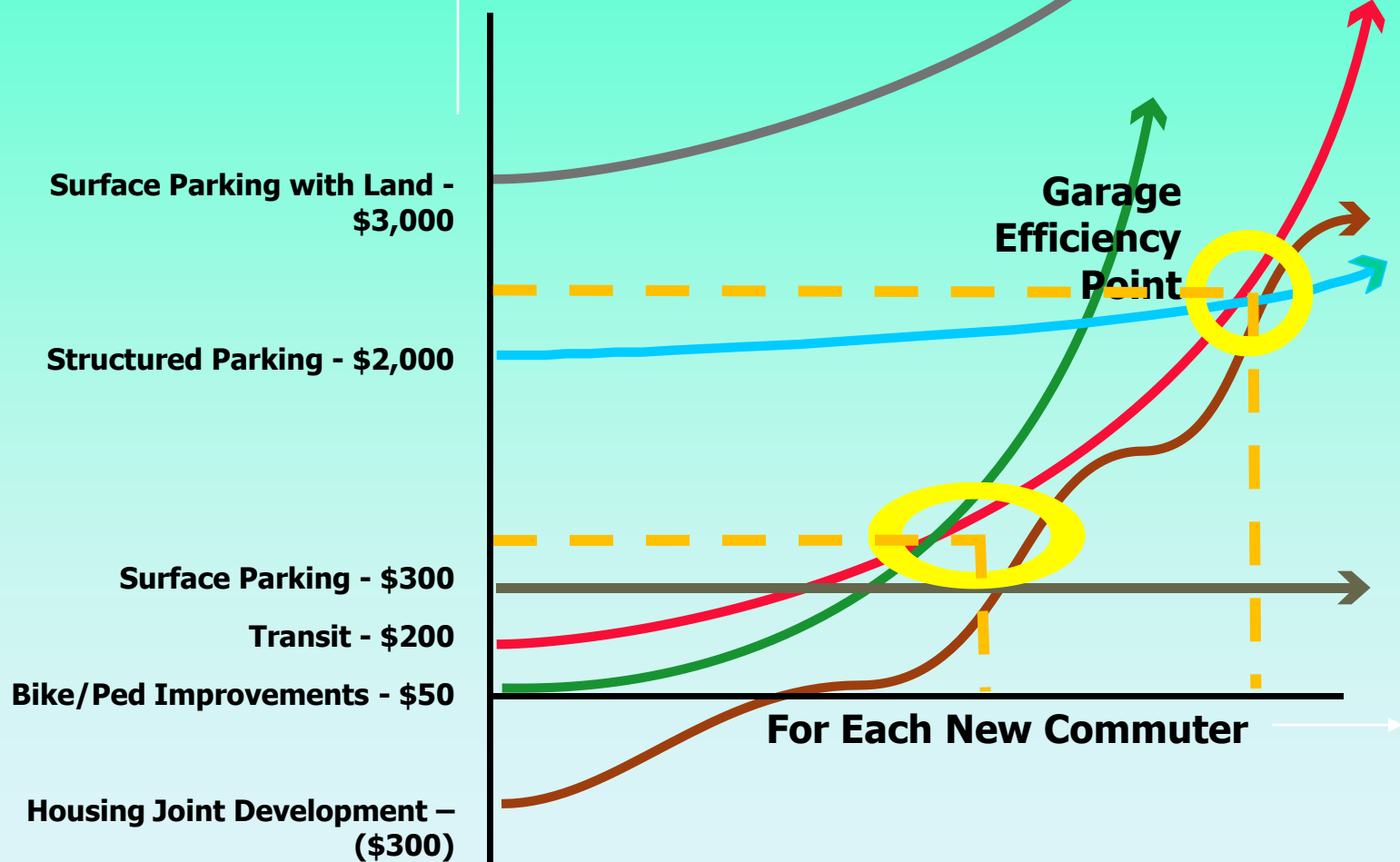


Stanford University

***Detailed study of true cost
by mode per commuter***

Cost Comparison By All Mode

Annual Cost Per Commuter



Is Transit Really More Expensive to Operate?



- ~~New Parking Garage~~
\$7 per commuter per day
- Stanford's Free Shuttle
\$2 per commuter per day

Determined it is cheaper to pay commuters not to drive than to provide more parking



'96 6 27



Parking Cash-Out = Savings to Business

- Cornell
- Stanford University
- Dartmouth
- Microsoft
- Wyeth Pharmaceuticals
- Genentech
- Rhode Island public employees
- CA State law



Unbundle parking costs

- **Parking spaces are sold or leased separately from residence (“unbundled”)**
- **Reduces cost of housing and commercial space**

Gaia Building, Berkeley

- 91 apartments, theater, café & office space
- 42 parking spaces supplied
- Result: 237 adult residents with just 20 cars



Unbundle parking costs

House A:

- 2,000 sq. ft.
- 3 bedrooms
- 2-car garage
- **\$500,000**



House B:

- 2,300 sq. ft.
- 4 bedrooms
- 1-car garage
- **\$500,000**



Residential Carshare Program

- Carshare programs are like automated, web-based rental cars in your neighborhood
- Each carshare vehicle eliminates demand for 15-20 private vehicles and each carshare member reduces their driving by an average of 50%



OTHER STRATEGIES

Fees-in-Lieu of Parking

If you can't abolish minimums easily

- Typically in CBDs
- A by-right payment of a one-time or annual fee
- \$200 - \$35,000 per space of required off-street parking
- Deposited in a parking fund for future shared parking



Fees-in-Lieu of Parking

Advantages:

- Provides funding for municipal parking
- Allows infill/reuse of constrained sites

Disadvantages:

- Relies on the maintenance of parking minimums
- Often poorly tied to parking construction cost

Fees-in-Lieu of Parking

Northampton

- In the CBD there is a by-right payment of a one-time fee of \$2,000 per space of required off-street parking
- Deposited in a Downtown Parking Reserve Account to use for adding spaces, *improving the use of spaces*, and *reduce the need* for parking



Fees-in-Lieu of Parking

Oak Bluffs

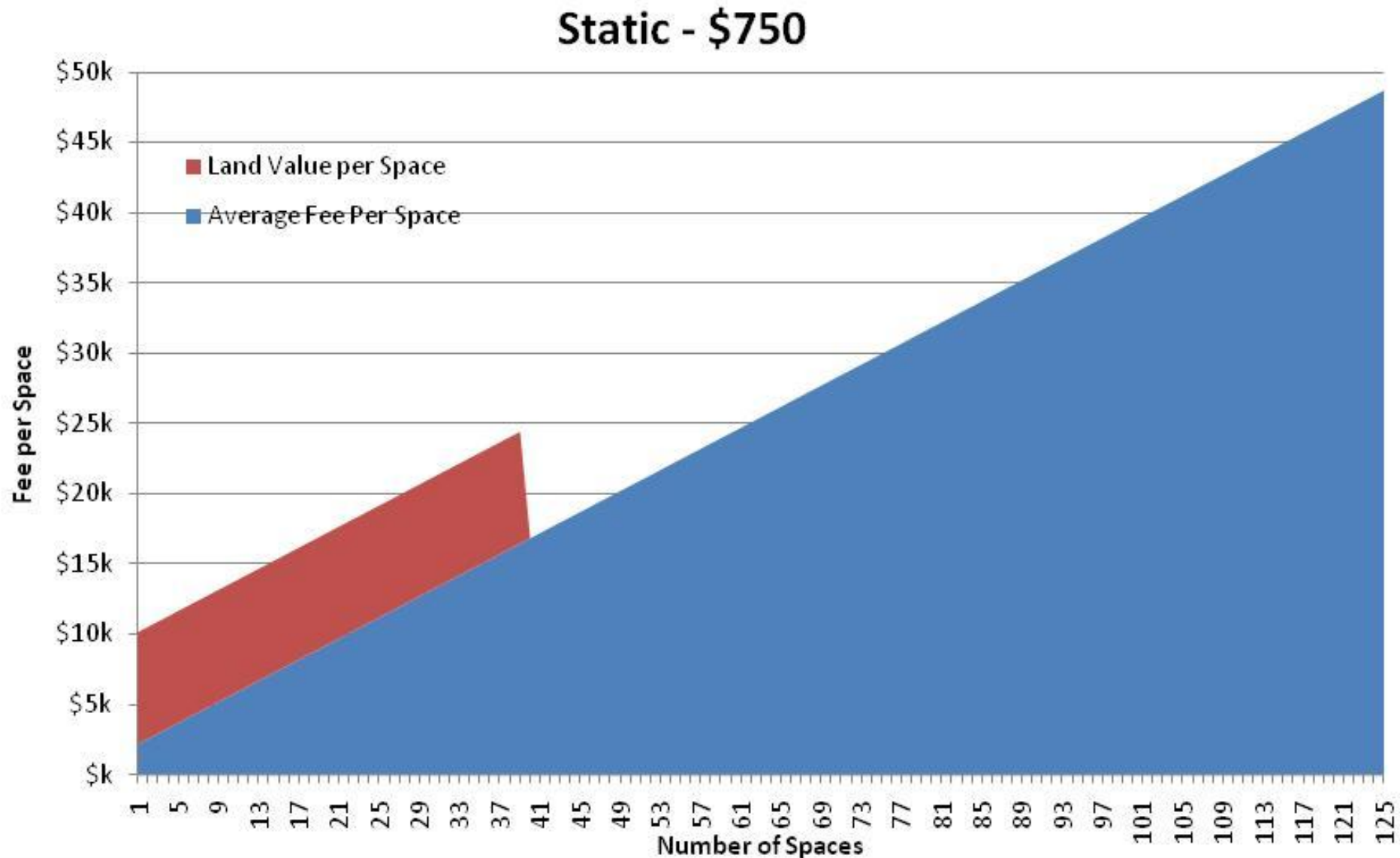
- Allows businesses within B-1 Business District to pay an annual fee-in-lieu of unmet parking requirements to the Oak Bluffs B-1 Business District Parking Mitigation Trust
 - ❖ \$100/space for first 5
 - ❖ \$75/space for additional 6-15
 - ❖ \$50/space for each over 15



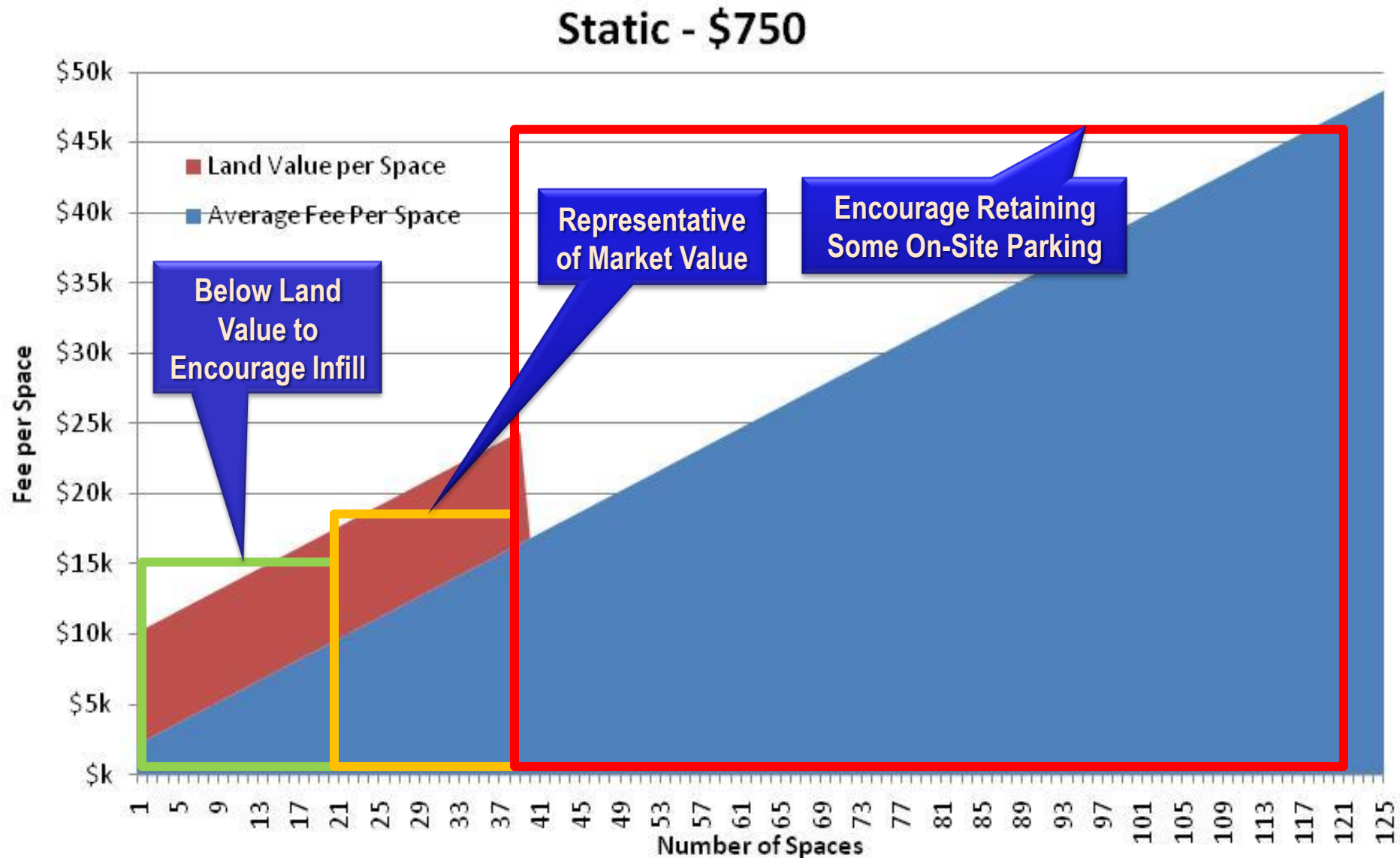
Progressive In-Lieu Fee Schedule

A	B	C	D	E
Number of Spaces	Per Space Fee Basis	Increment	Total Fee	Average Fee Per Space
	(previous B plus C)		(sum of all B values)	(= D/A)
	\$ 2,000	\$ 750		
1	\$ 2,750	\$ 750	\$ 2,750	\$ 2,750
2	\$ 3,500	\$ 750	\$ 6,250	\$ 3,125
3	\$ 4,250	\$ 750	\$ 10,500	\$ 3,500
4	\$ 5,000	\$ 750	\$ 15,500	\$ 3,875
5	\$ 5,750	\$ 750	\$ 21,250	\$ 4,250
6	\$ 6,500	\$ 750	\$ 27,750	\$ 4,625
7	\$ 7,250	\$ 750	\$ 35,000	\$ 5,000
8	\$ 8,000	\$ 750	\$ 43,000	\$ 5,375
9	\$ 8,750	\$ 750	\$ 51,750	\$ 5,750
10	\$ 9,500	\$ 750	\$ 61,250	\$ 6,125

Progressive In-Lieu Fee Schedule

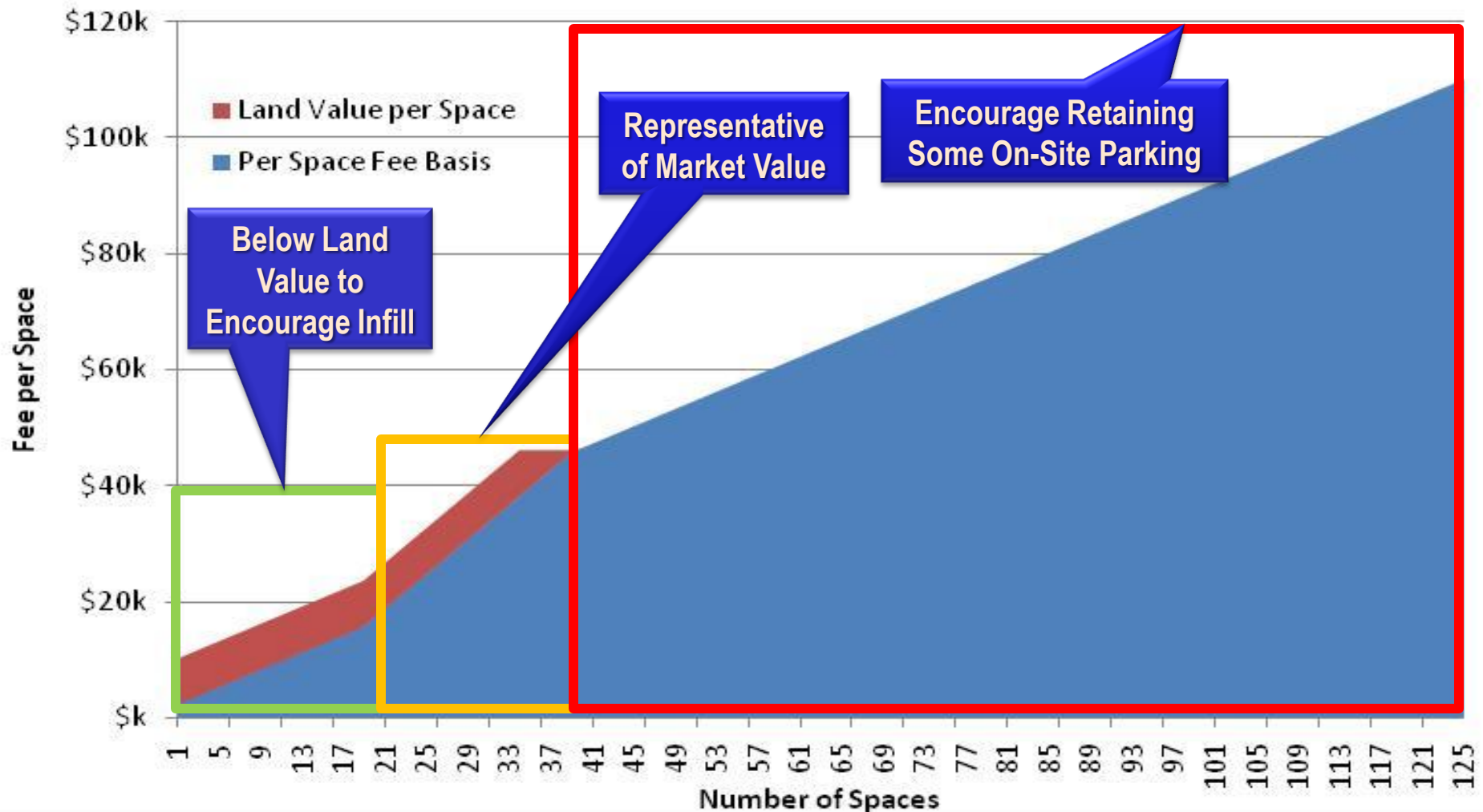


Progressive In-Lieu Fee Schedule



Progressive In-Lieu Fee Schedule

Dynamic \$1500 Increment



Reducing Aesthetic Impacts

Acton

- Off-street parking is prohibited between primary building front and street in the “Village” designated districts



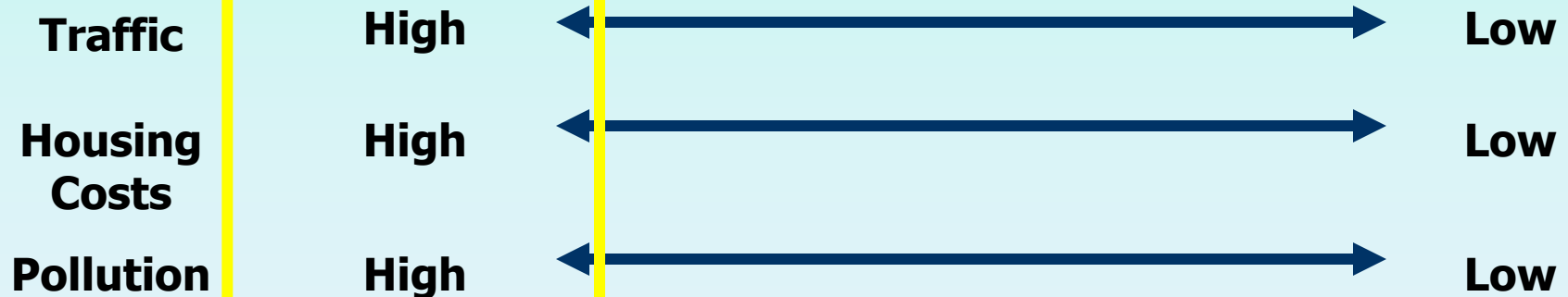
Don't Forget the Environment: Low Impact Development

- Impervious paving (Hamden CT)
- Grassed overflow parking (Lowes)
- Bio swales & other BMPs (public works dept.)
- Tree canopies for heat island effects (planning boards)



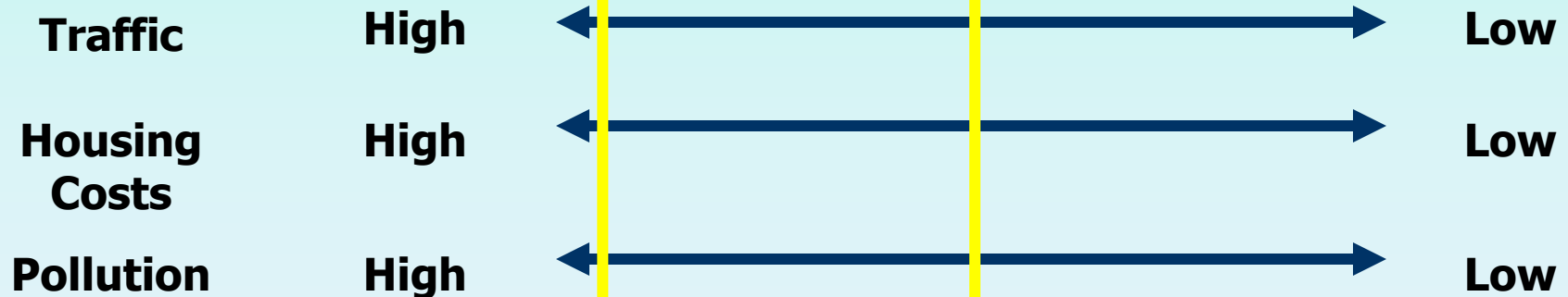
Parking: High & Low Traffic Strategies

	<u>Typical Minimum Requirements</u>	<u>'Tailored' Minimum Requirements</u>	<u>Abolish Minimum Requirements</u>	<u>Set Maximum Requirements</u>
Typical Tools	<ul style="list-style-type: none"> ❖ Requirement > Average Demand ❖ Hide all parking costs 	Adjust for: <ul style="list-style-type: none"> ❖ Density ❖ Transit ❖ Mixed Use ❖ 'Park Once' District ❖ On-street spaces ❖ ...etc. 	<ul style="list-style-type: none"> ❖ Market decides ❖ Garages funded by parking revenues ❖ Manage on-street parking ❖ Residential pkg permits allowed by vote 	<ul style="list-style-type: none"> ❖ Limit parking to road capacity ❖ Manage on-street parking ❖ Market rate fees encouraged/required



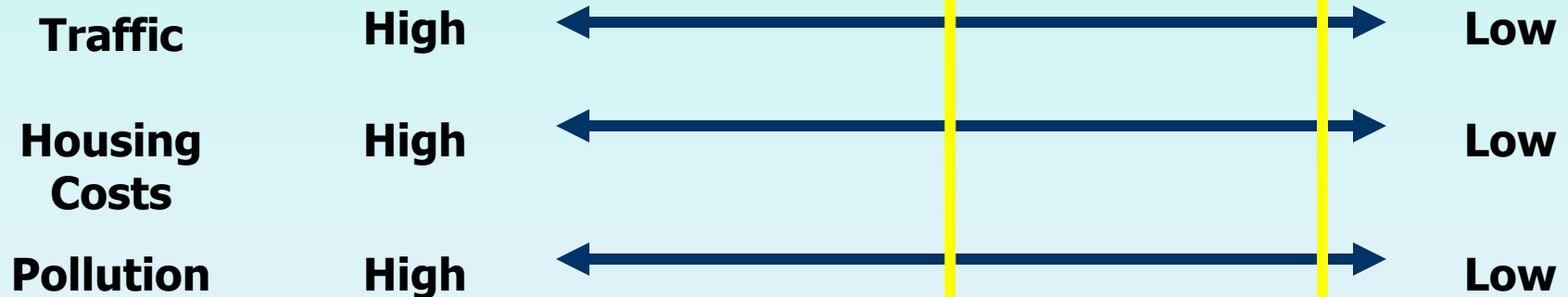
Parking: High & Low Traffic Strategies

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Parking: High & Low Traffic Strategies

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Questions? Ideas? Discussion?





Session 4

MARKET REALITIES

MARKET DEMAND AND THE BANKS

Developer Fallacies

- “The Bank won’t approve the project without more parking”
 - Wrong.** Banks don’t care about parking. They care about return on investment. Show a successful comp.
(what bank wants to kill a good project by forcing more parking to be built?)
- “The market demands 2 spaces per unit”
 - Wrong.** There is no survey of residential market demand, only preferences. Reality is barely 1 per unit nationwide.

Completed:

Fenway Mixed-Use, Boston

Near Green Line Stop

580 units

.86 spaces provided per dwelling unit



Completed:

Ten Faxon Apartments, Quincy

Near Red Line stop

200 units

1.02 spaces provided per dwelling unit



Under Construction:

Dudley Village, Dorchester

Near Red Line Stop

50 units

1.18 spaces provided per dwelling unit



Under Construction:

Bartlett Yard, Roxbury

Near Silver Line

313 units

1.04 spaces provided per dwelling unit



LIABILITY

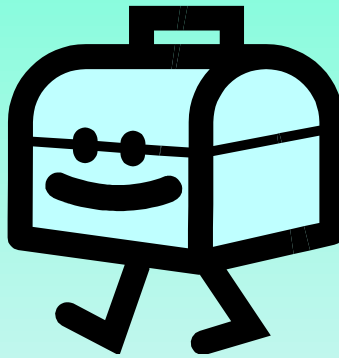
Liability

- **On public property:** Municipalities have limited liability protection
- **On private property:** Liability protection is standard with insurance
- Why are lots chained off?
 - Not typically for liability concerns – rather protection of private property
 - Insurance to cover liability of more users is incremental cost, but cost for property insurance is higher
- **Can public purchase private liability?** Unclear

Questions? Ideas? Discussion?



Lunch!





Session 5

REGULATORY STRATEGIES

ON-STREET PRICING

**If parking has value,
why is on-street
parking so cheap?**













DOWNTOWN PARKING OCCUPANCY

**Main Street -
free**



**Parking structures -
\$1.50/hour**



- **Building more spaces cannot solve the on-street shortage**

DEMAND RESPONSIVE PRICING

Bestparking.com

Daily Specials

From \$15

Arrival:

February 9 2010
12:00 AM

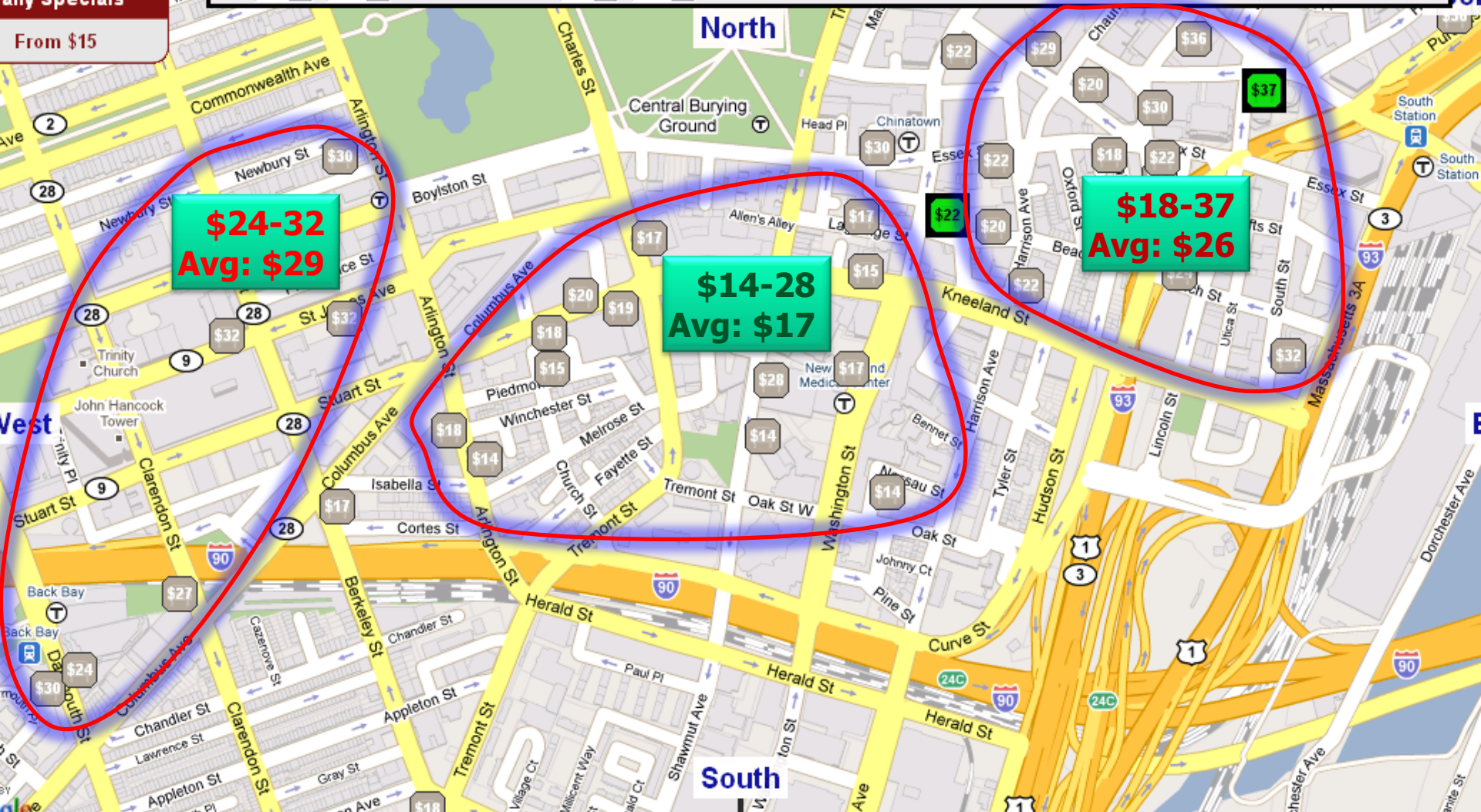
Departure:

February 9 2010
4:00 AM

Calculate Rates



Rate Guarantee
(Space Permitting)



Example: Redwood City, CA

- Plagued by traditional parking “problems”:
 - 100% utilization on Broadway all day long
 - Perception of parking unavailability



Photo by BWChicago

❖ BUT:

- Ample unused parking around the corner from commercial strip
- Peak occupancy 69% in city-owned lots (ideal is 85%); 78% at the height of the dot-com boom

Example: Redwood City, CA

- City staff asked, “Do we actually have a parking *shortage*, as perceived by motorists, or a parking *management* problem?”
- Decided on a strategy set:
 1. Institute Market-Rate Pricing
 2. Eliminate Time Limits
 3. Convert the Core to Computerized “Pay-by-Space” Meters
 4. Modify the Parking Permit Program

Example: Redwood City, CA

- #1: Institute Market-Rate Pricing
 - Initial starting fee structure set
 - Fee structure set to price most desirable spots the highest
 - Maintain 85% occupancy (by ordinance)
 - Priced differently at highest-use times (Weekdays 10AM-6PM) than at off-peak times



Example: Redwood City, CA

- #2: Eliminate Time Limits

- Time limits impose an artificial restriction on usage and are inconvenient
- Enforcement is costly to manage
- Time limits not efficient at producing even 85% occupancy
- Allow pricing to create turnover instead

Example: Redwood City, CA

- #3: Convert to Pay-by-Space Meters
 - Able to track occupancy rates and adjust price rates accordingly
 - A host of other benefits:
 - Better urban design
 - Quicker repairs
 - Solar power
 - Better information
 - Revenue control
 - Better data collection
 - Convenience



Source: Digital Payment Technologies, 2005

Example: Redwood City, CA

- #4: Modify the Parking Permit Program
 - To accommodate employees, crafted a parking permit program for spaces in garages with varying levels of access for purchase



Permit Type	Valid Locations and Times	Monthly Cost
Marshall / Middlefield BRONZE	Marshall Garage: Monday - Friday, 6am until 7pm Middlefield Lot: Monday - Friday, 6am until 7pm	\$30.00
Marshall / Middlefield SILVER	Marshall Garage: Monday - Friday, 6am until Midnight Middlefield Lot: Monday - Friday, 6am until 7pm	\$35.00
Marshall / Middlefield GOLD	Marshall Garage: Monday - Sunday, 6am until Midnight Middlefield Lot: Monday - Friday, 6am until 7pm	\$40.00
Perry / Winslow / Main BRONZE	Perry Lot: Monday - Friday, 6am until 7pm Winslow Lot: Monday - Friday, 6am until 7pm Main St. Lot: Monday - Friday, 6am until 7pm	\$40.00
Perry / Winslow / Main SILVER	Perry Lot: Monday - Friday, 6am until Midnight Winslow Lot: Monday - Friday, 6am until Midnight Main St. Lot: Monday - Friday, 6am until Midnight	\$50.00
Perry / Winslow / Main GOLD	Perry Lot: Monday - Sunday, 6am until Midnight Winslow Lot: Monday - Sunday, 6am until Midnight Main St. Lot: Monday - Sunday, 6am until Midnight	\$60.00

Example: Redwood City, CA

- Program has been highly successful:
 - Greater turnover and parking distributed more evenly across district
 - Average length of stay 72 minutes (previously 1 hour limit)
 - Monthly permit sales up 50%
 - \$1 million in added revenues for added public services such as increased police protection and cleaner sidewalks
 - 82% occupancy on Broadway

Washington DC

Ward 6 Parking Pilot Zone:

- To protect neighborhood around Nationals ballpark



Washington DC

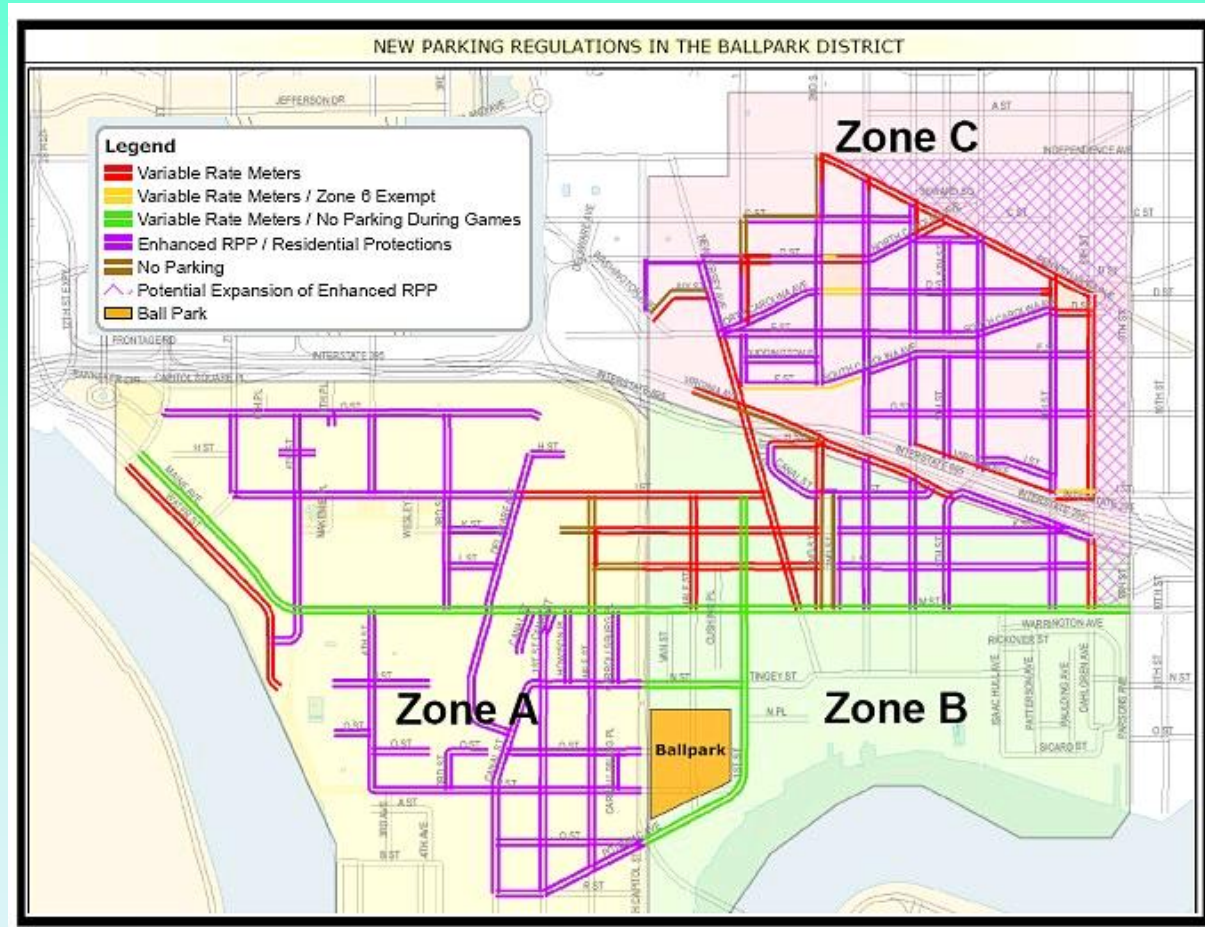
Ward 6 Parking Pilot Zone

- Commercial zones:

- 1st hr: \$1
- 2nd hr: \$1.50
- 3rd hr: \$1.50

- Gameday:

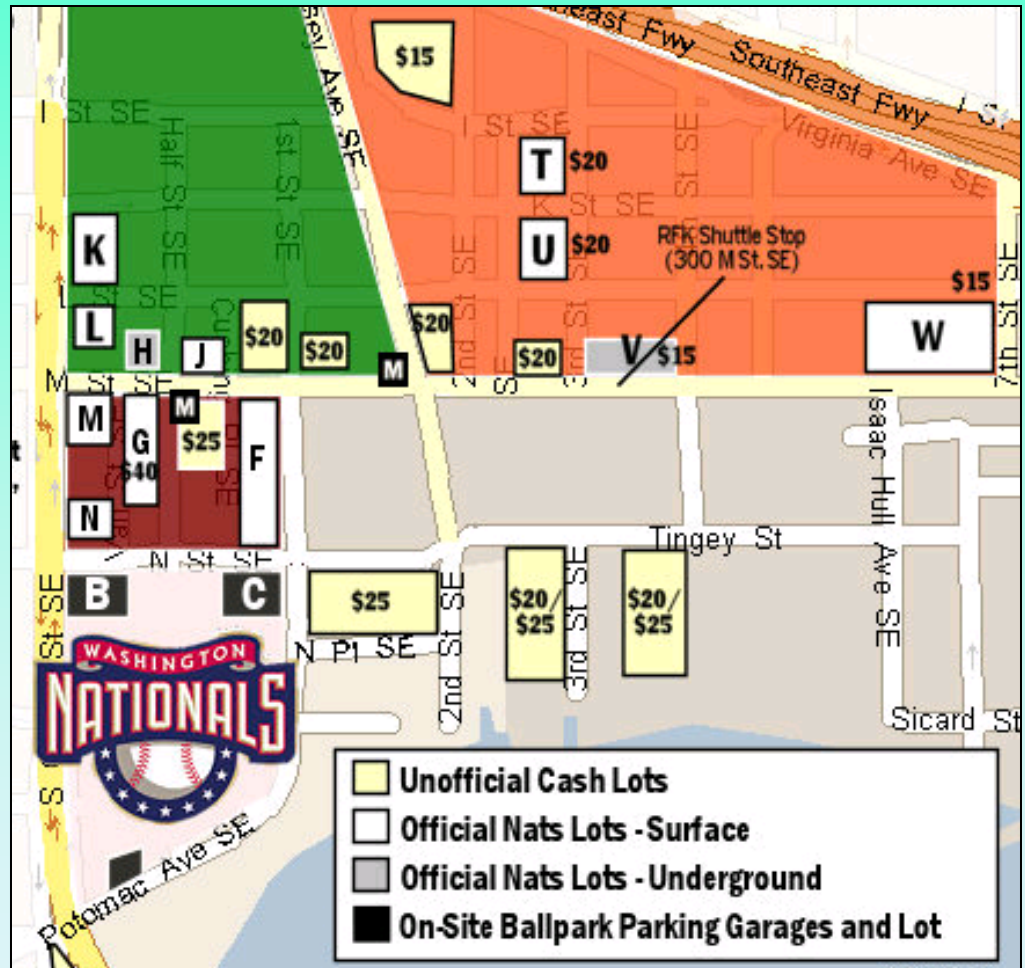
- 1st hr: \$2
- 2nd hr: \$8
- 3rd hr: \$8
- 4th hr: \$2



Washington DC

Ward 6 Parking Pilot Zone

- Commercial Lots:
 - Red Zone \$35
 - Green: \$25-15
 - Orange: \$20-15



Source: Jdland.com

Washington DC

Ward 6 Parking Pilot Zone

- Residential zones:

Zone B:

–Until 12am

Zone A & C:

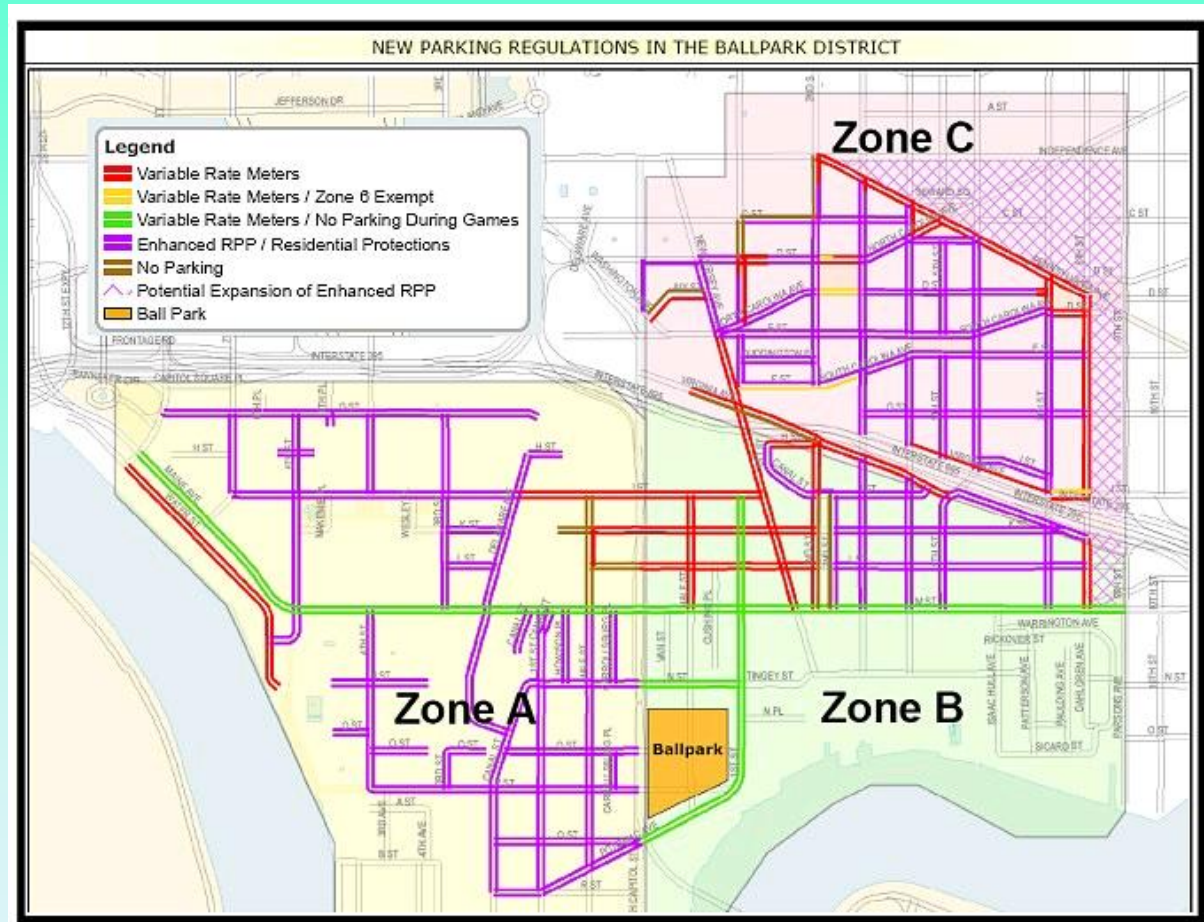
–Until 9:30pm

Transition zones:

–Meter hunting license

- Residential

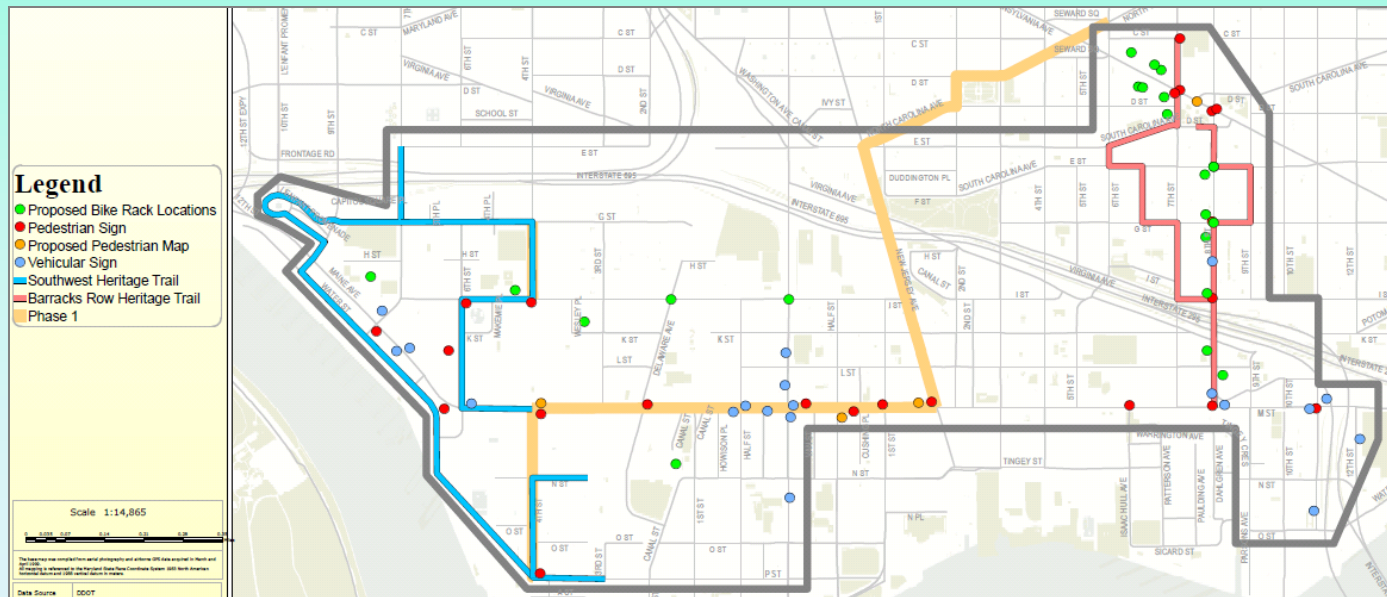
permits: **1st: \$15; 2nd: \$50; 3rd: \$100**



Washington DC

Ward 6 Parking Pilot Zone

- 138 pay stations (800 spaces) have produced \$1.4M in 19 months (at \$1/hr.)
- \$288,900 (20%) now available for community improvements

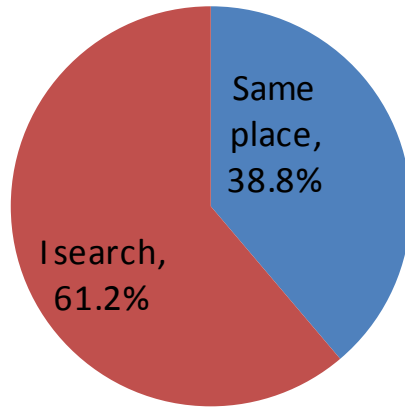


Salem Comprehensive Parking Study

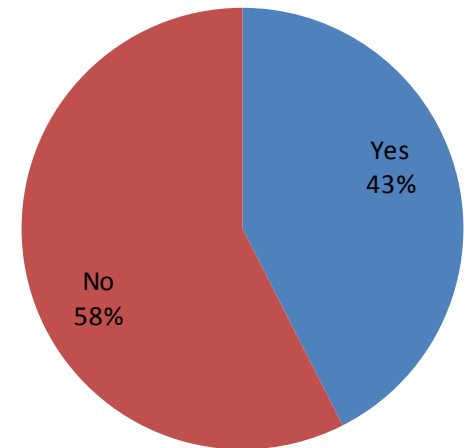


Survey Results

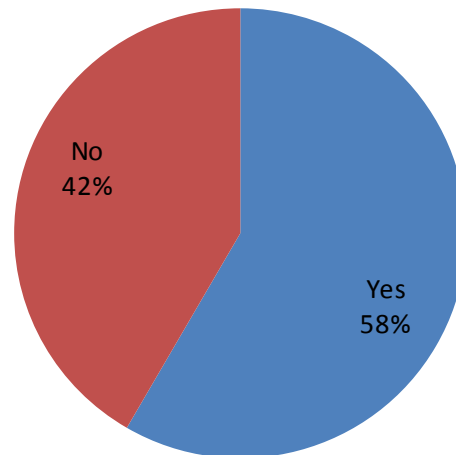
Do you always park in the same place or do you search?



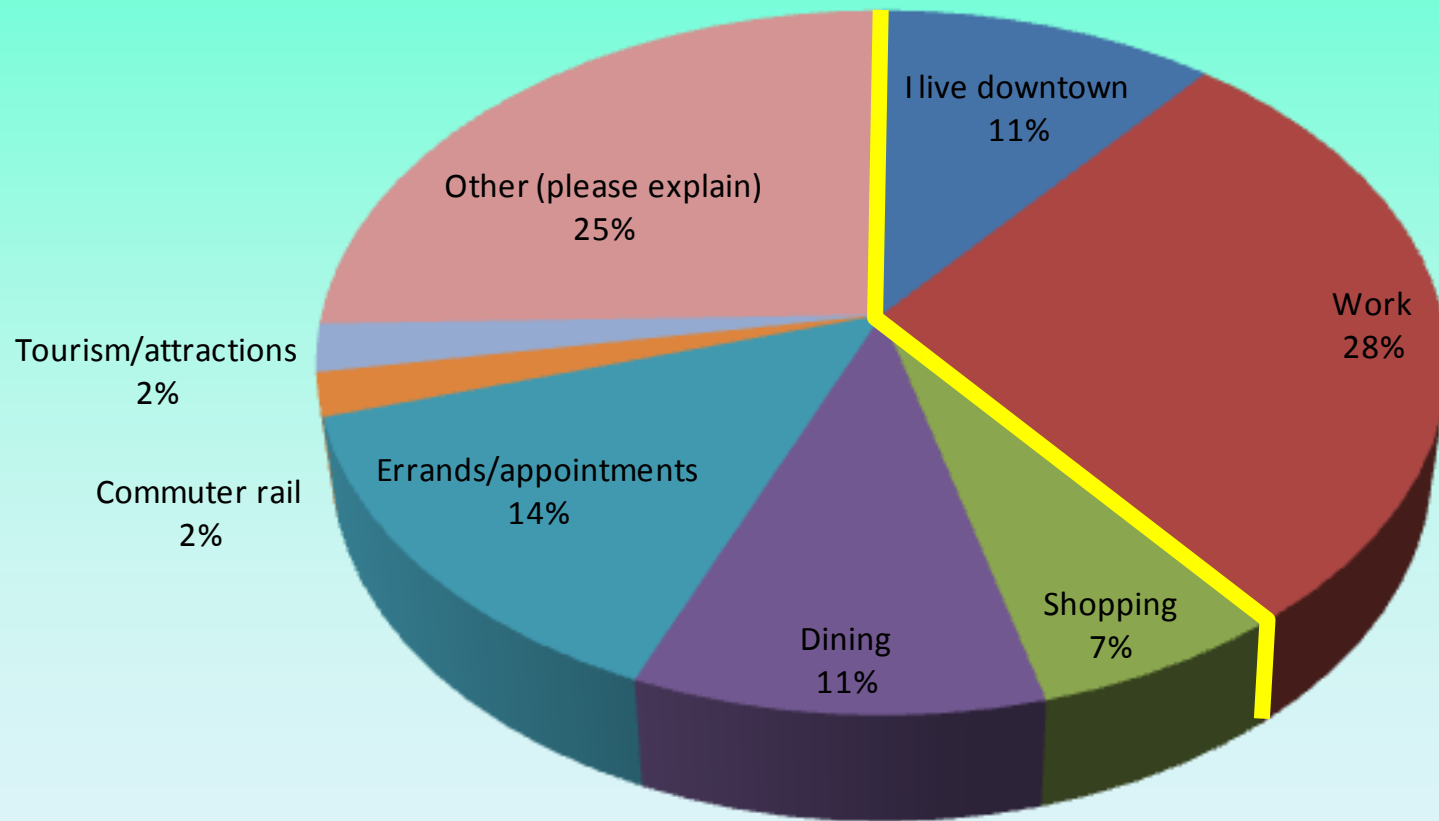
Are you ever forced to park or stand illegally?



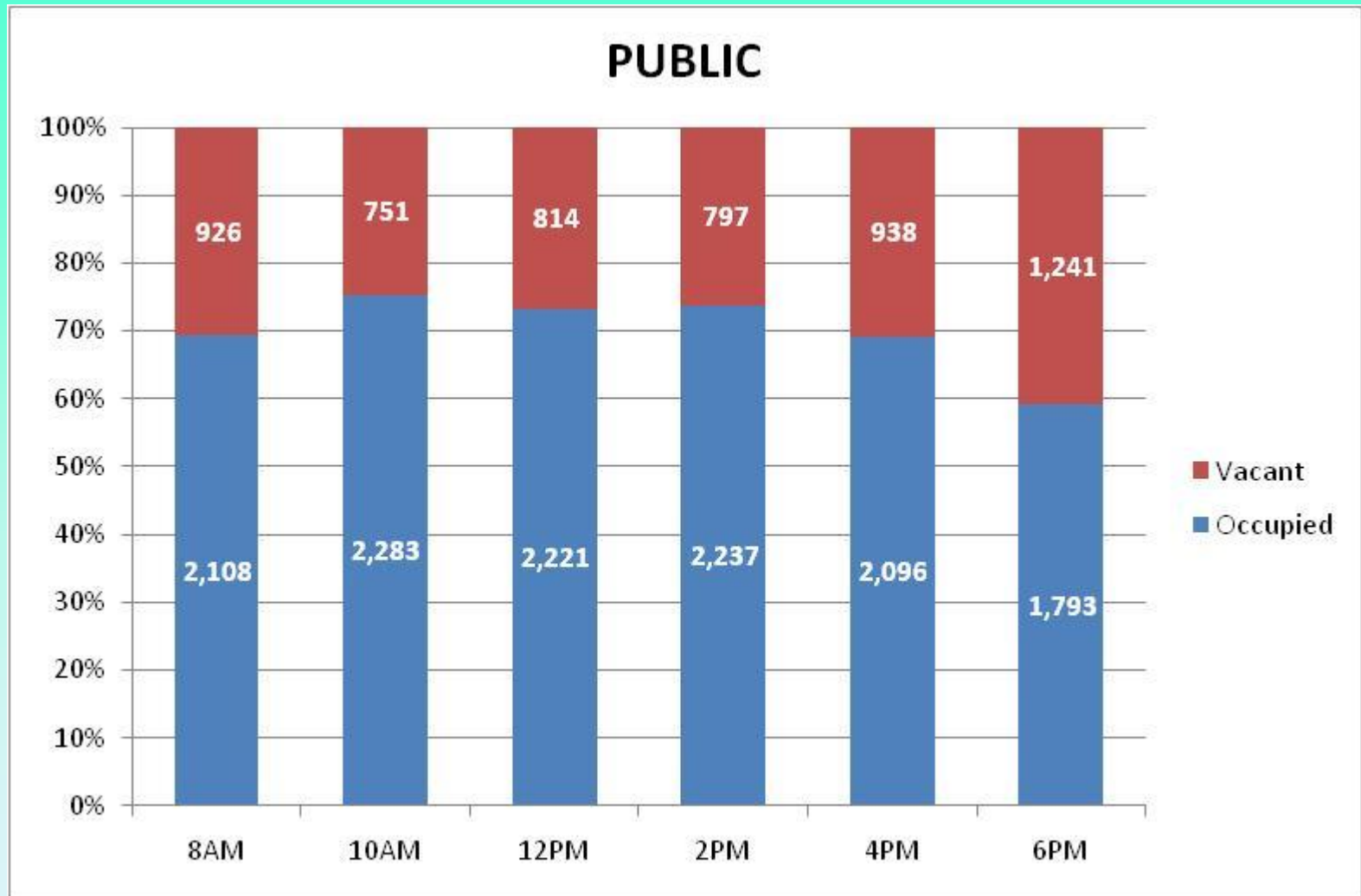
Have you ever failed to find parking and just left?



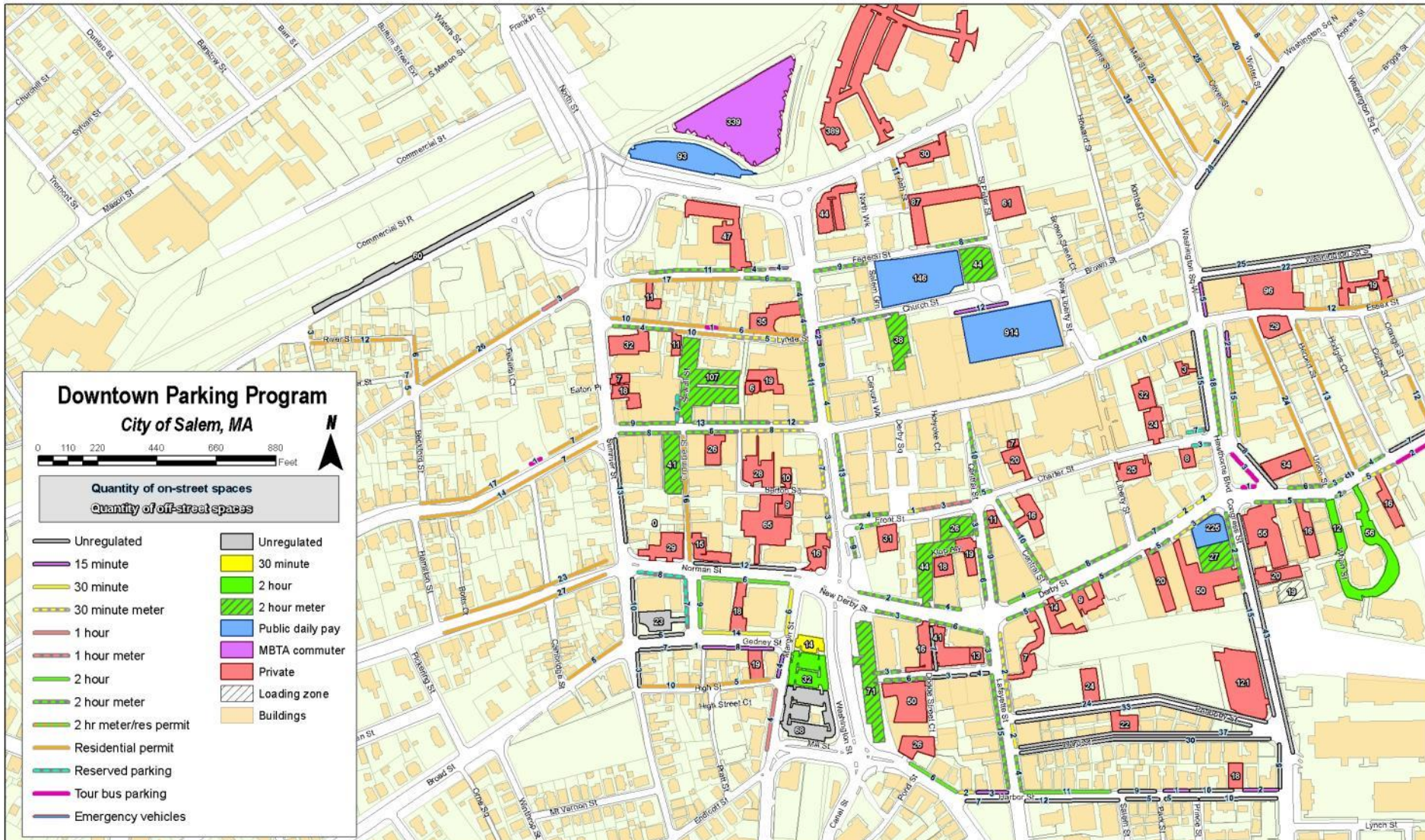
Respondents



Utilization Summaries



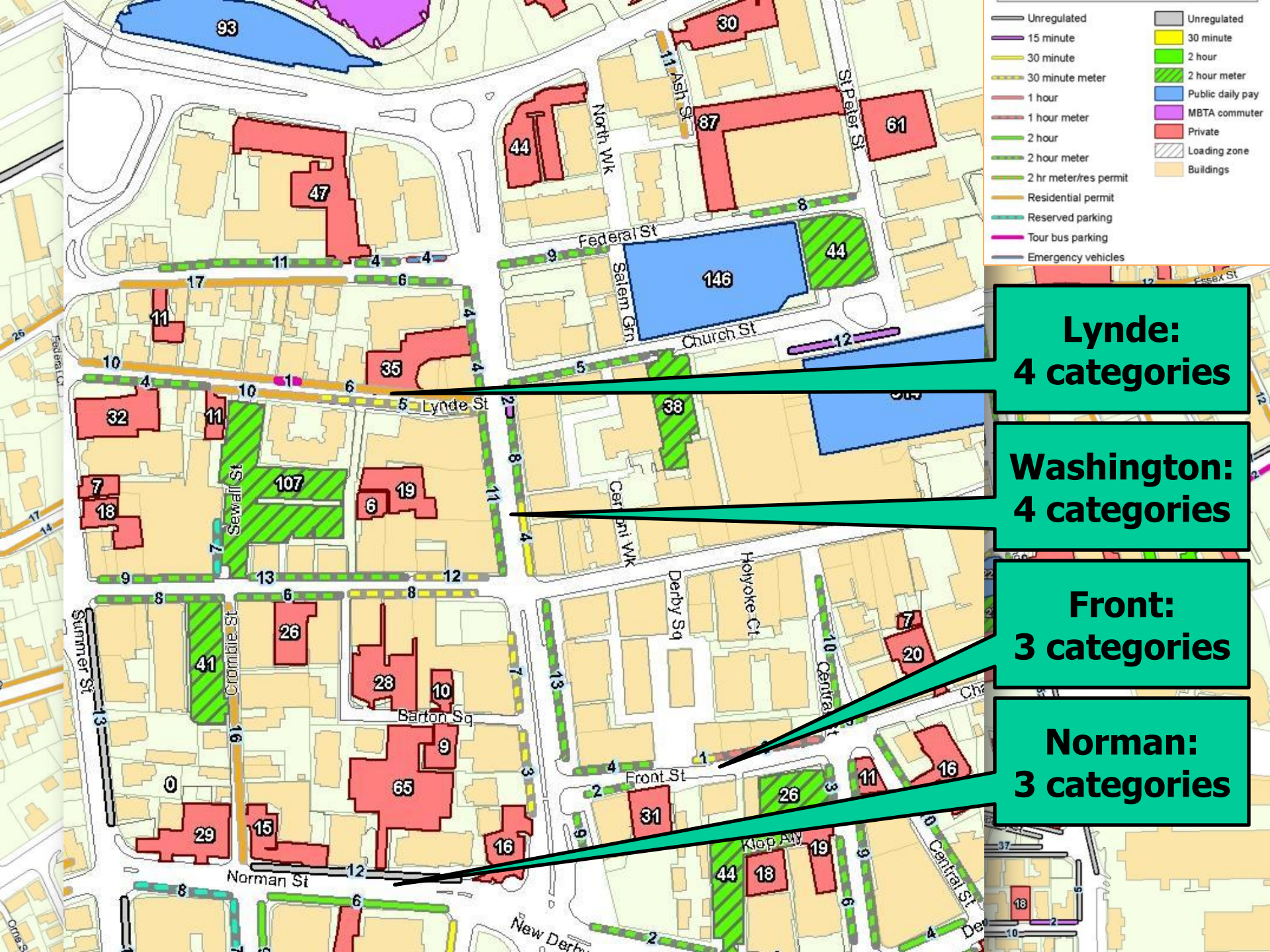
Current Parking Regulations





- | | | | |
|--|-----------------------|--|------------------|
| | Unregulated | | Unregulated |
| | 15 minute | | 30 minute |
| | 30 minute | | 2 hour |
| | 30 minute meter | | 2 hour meter |
| | 1 hour | | Public daily pay |
| | 1 hour meter | | MBTA commuter |
| | 2 hour | | Private |
| | 2 hour meter | | Loading zone |
| | 2 hr meter/res permit | | Buildings |
| | Residential permit | | |
| | Reserved parking | | |
| | Tour bus parking | | |
| | Emergency vehicles | | |



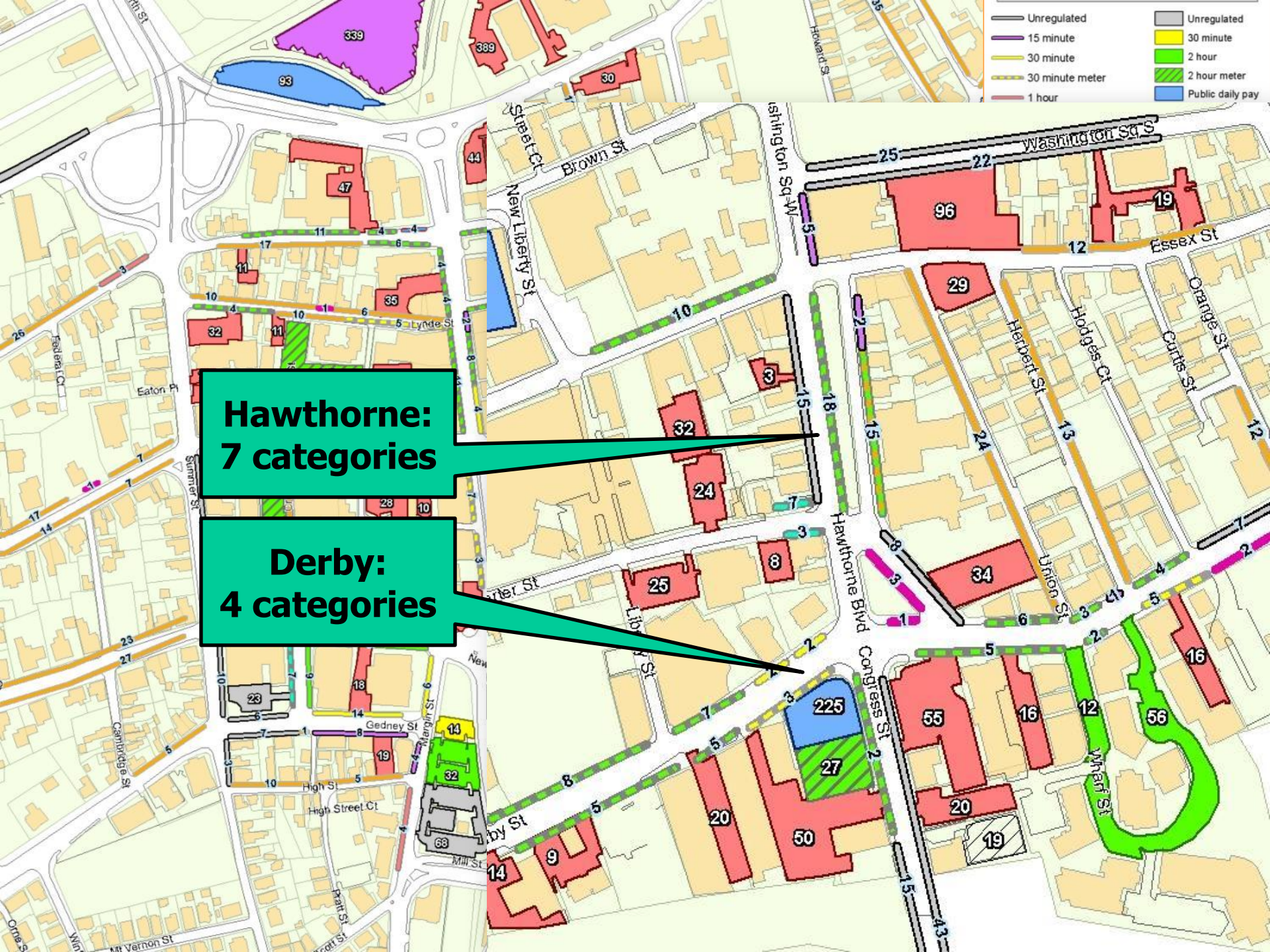


**Lynde:
4 categories**

**Washington:
4 categories**

**Front:
3 categories**

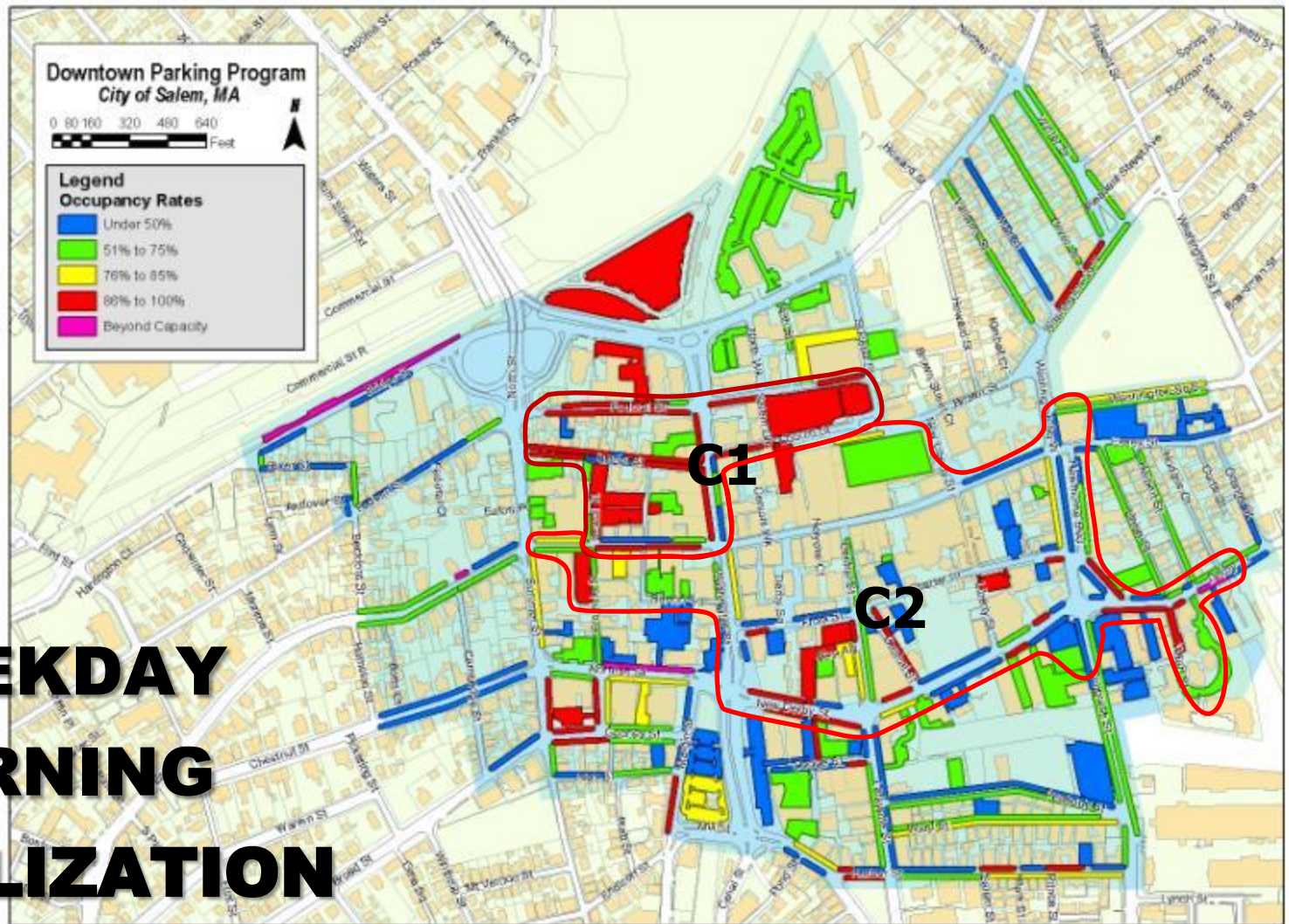
**Norman:
3 categories**



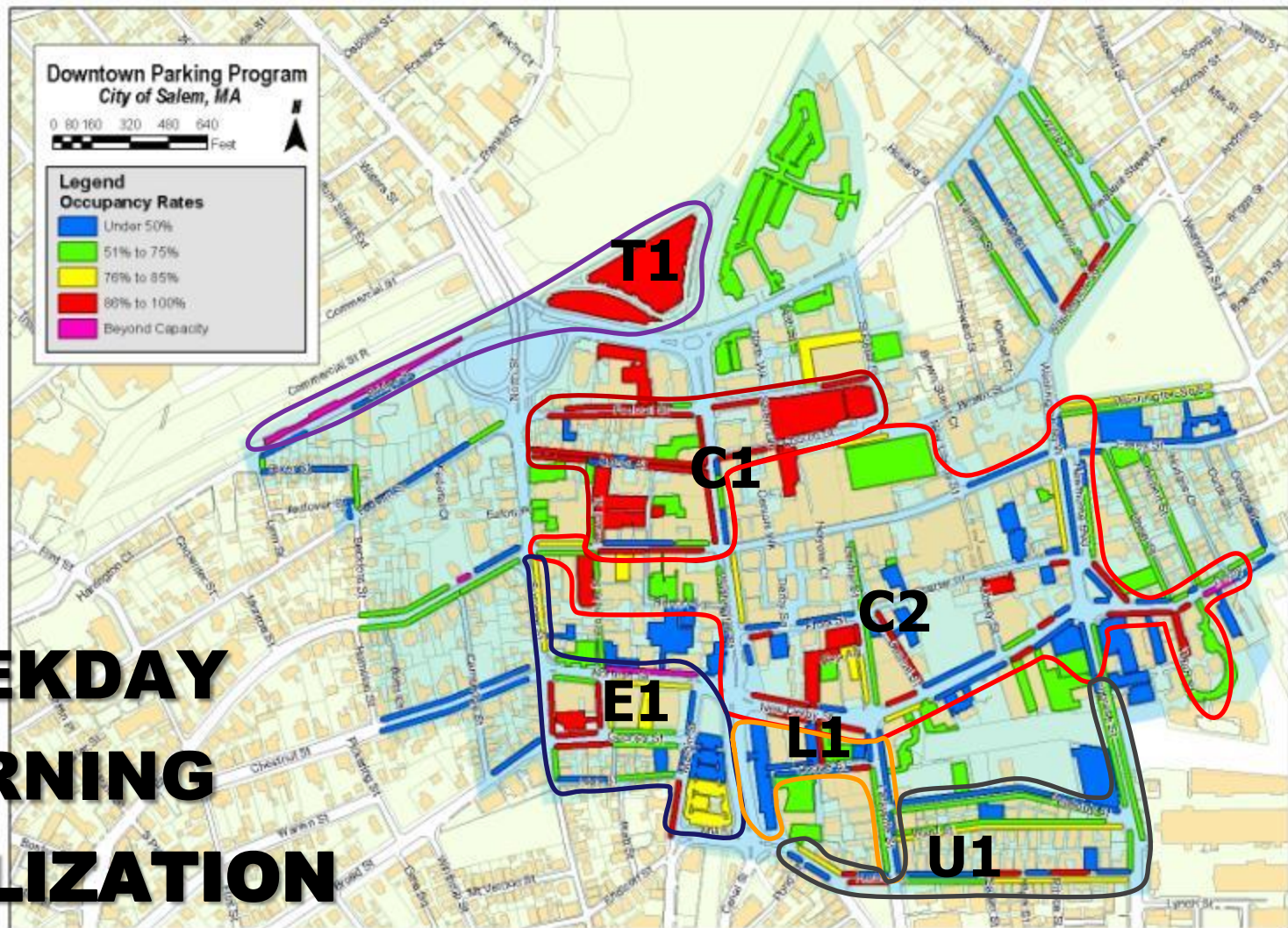
**Hawthorne:
7 categories**

**Derby:
4 categories**

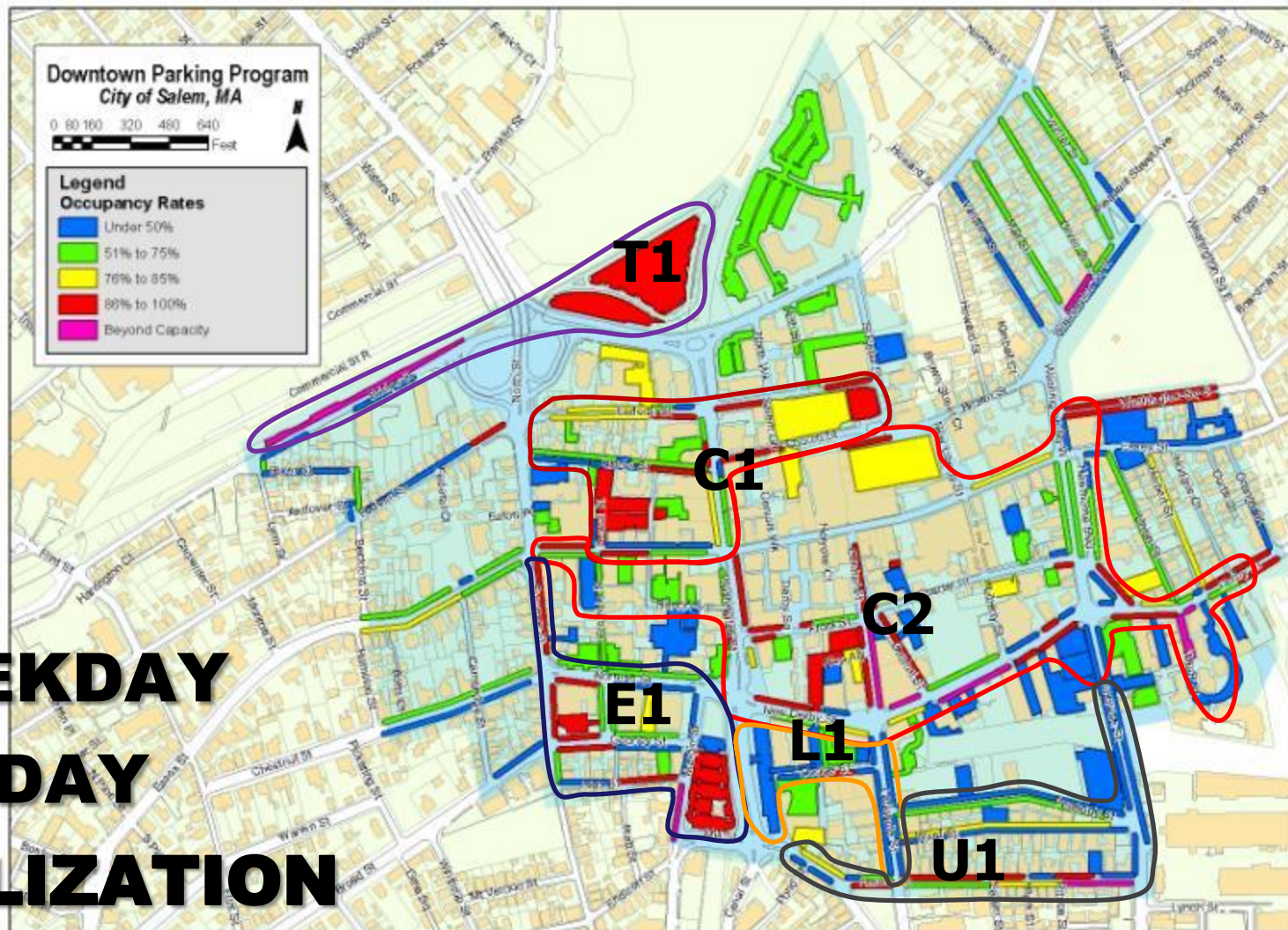
WEEKDAY MORNING UTILIZATION



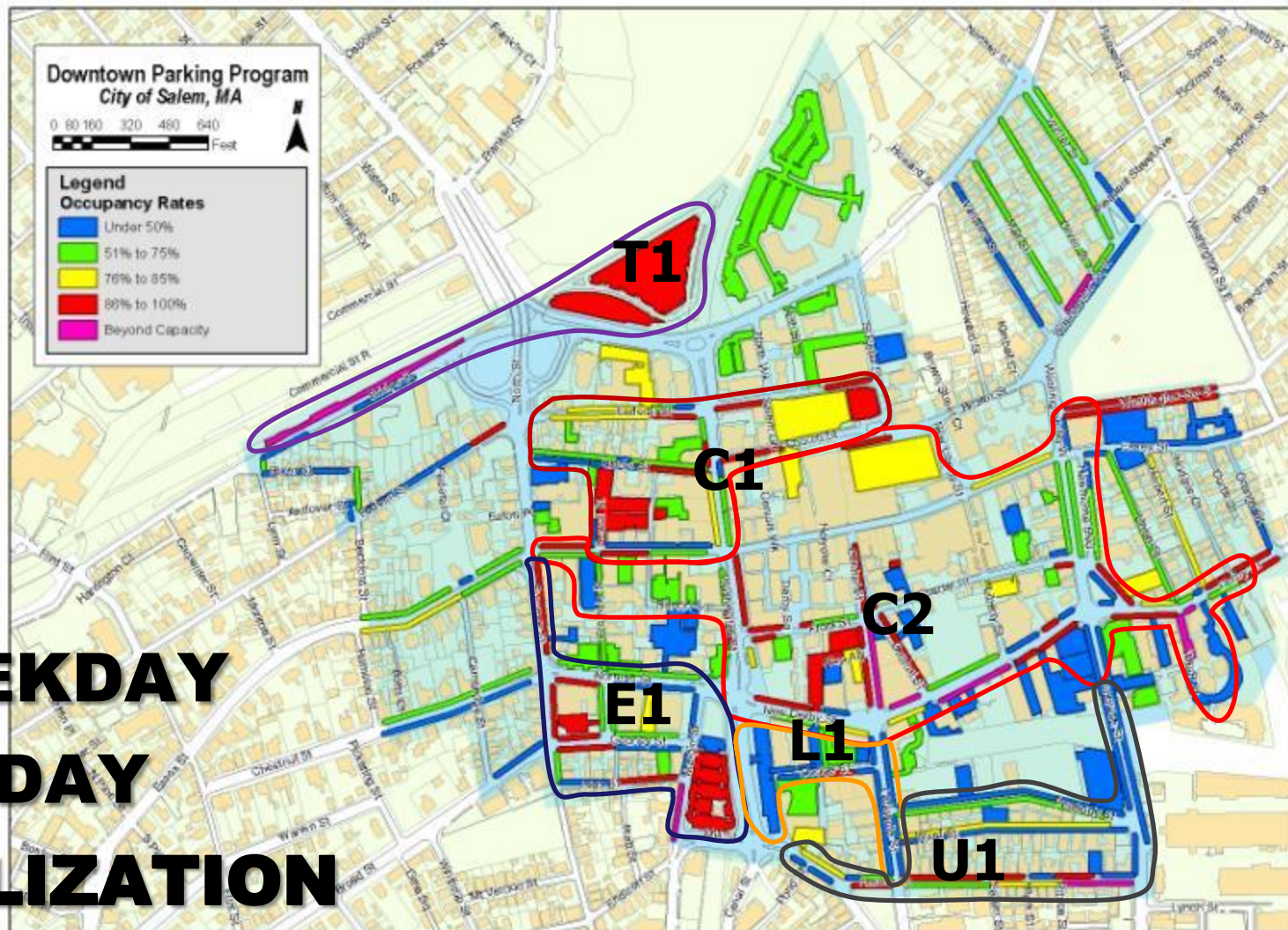
WEEKDAY MORNING UTILIZATION

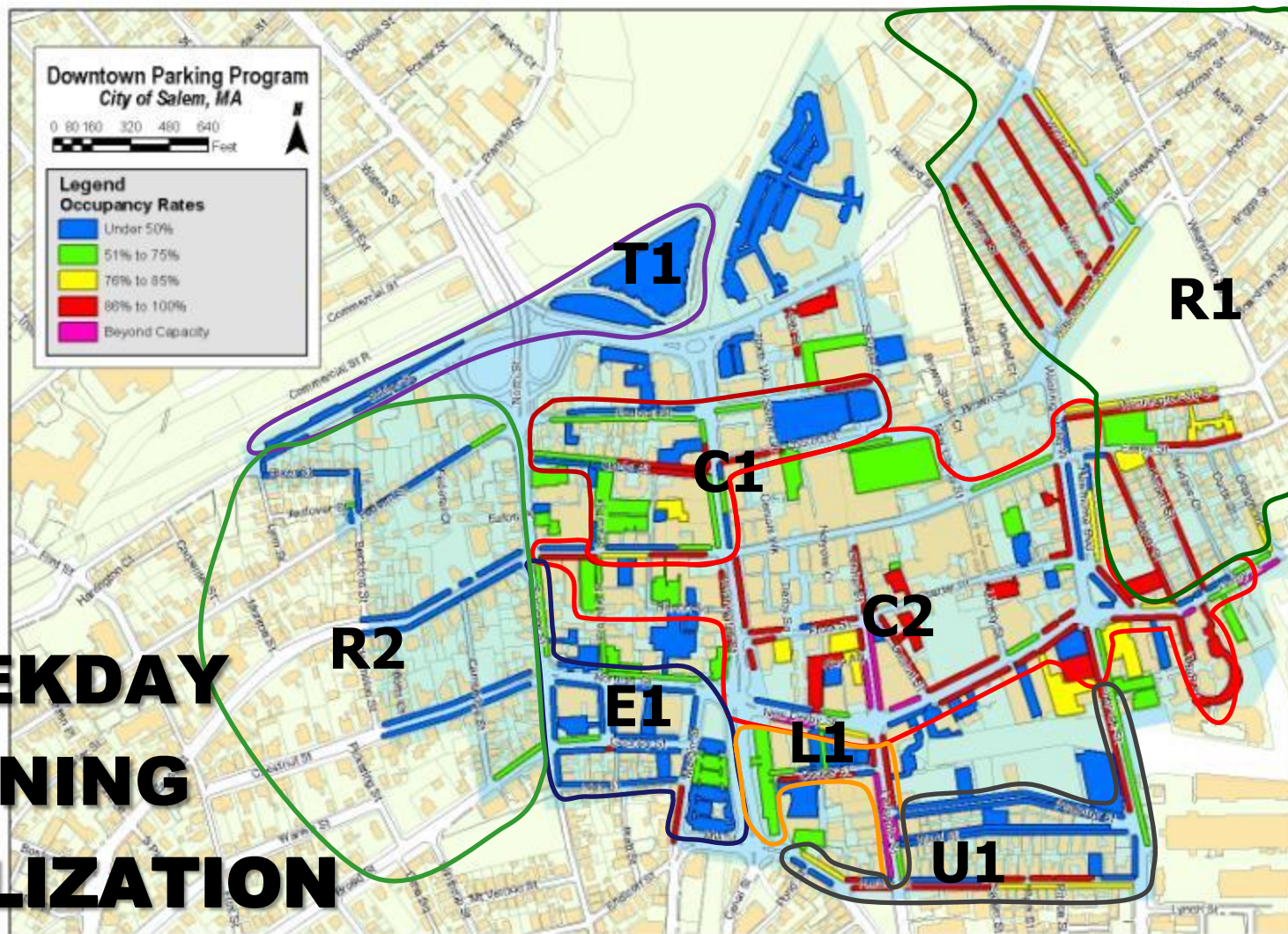


WEEKDAY MIDDAY UTILIZATION



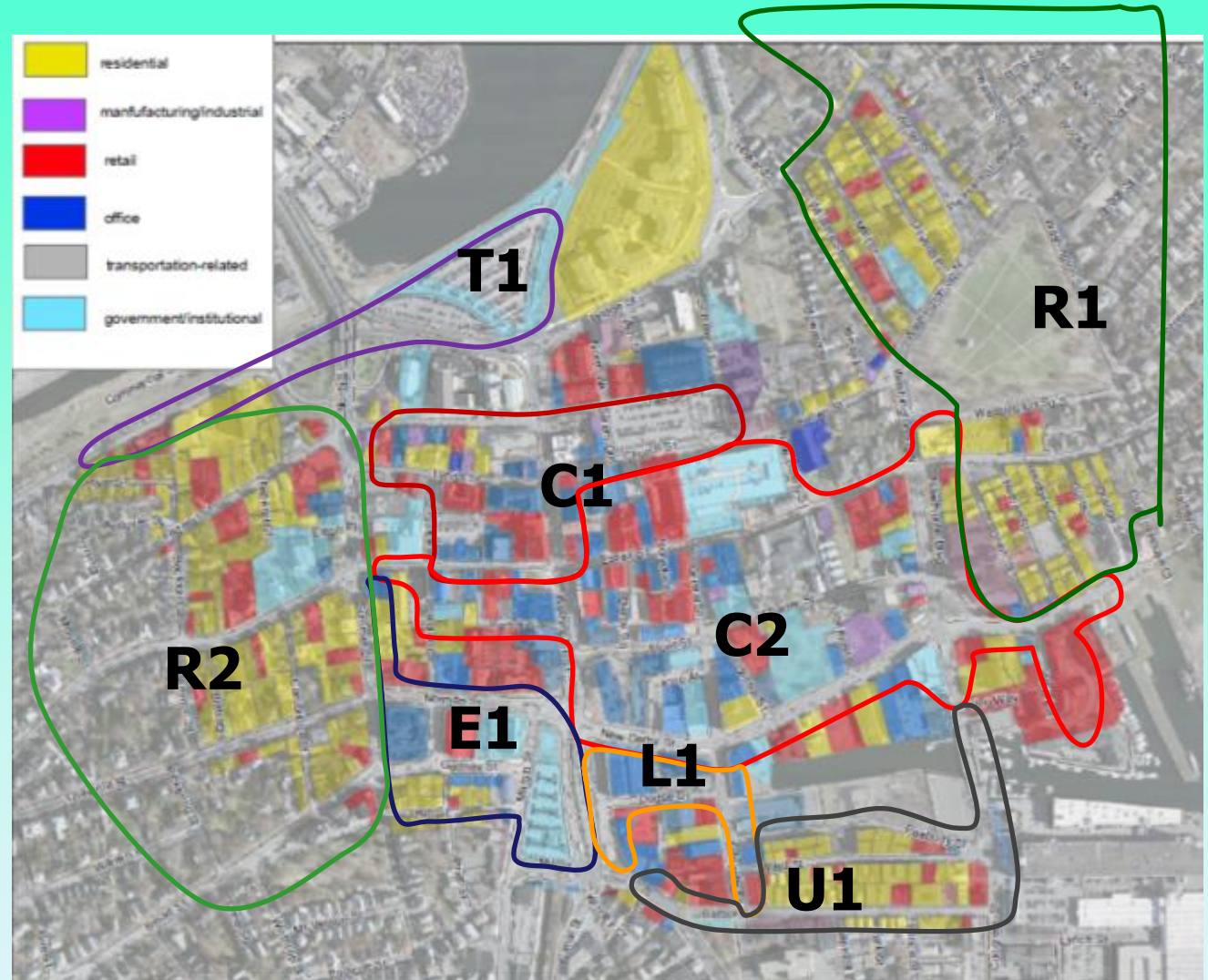
WEEKDAY MIDDAY UTILIZATION



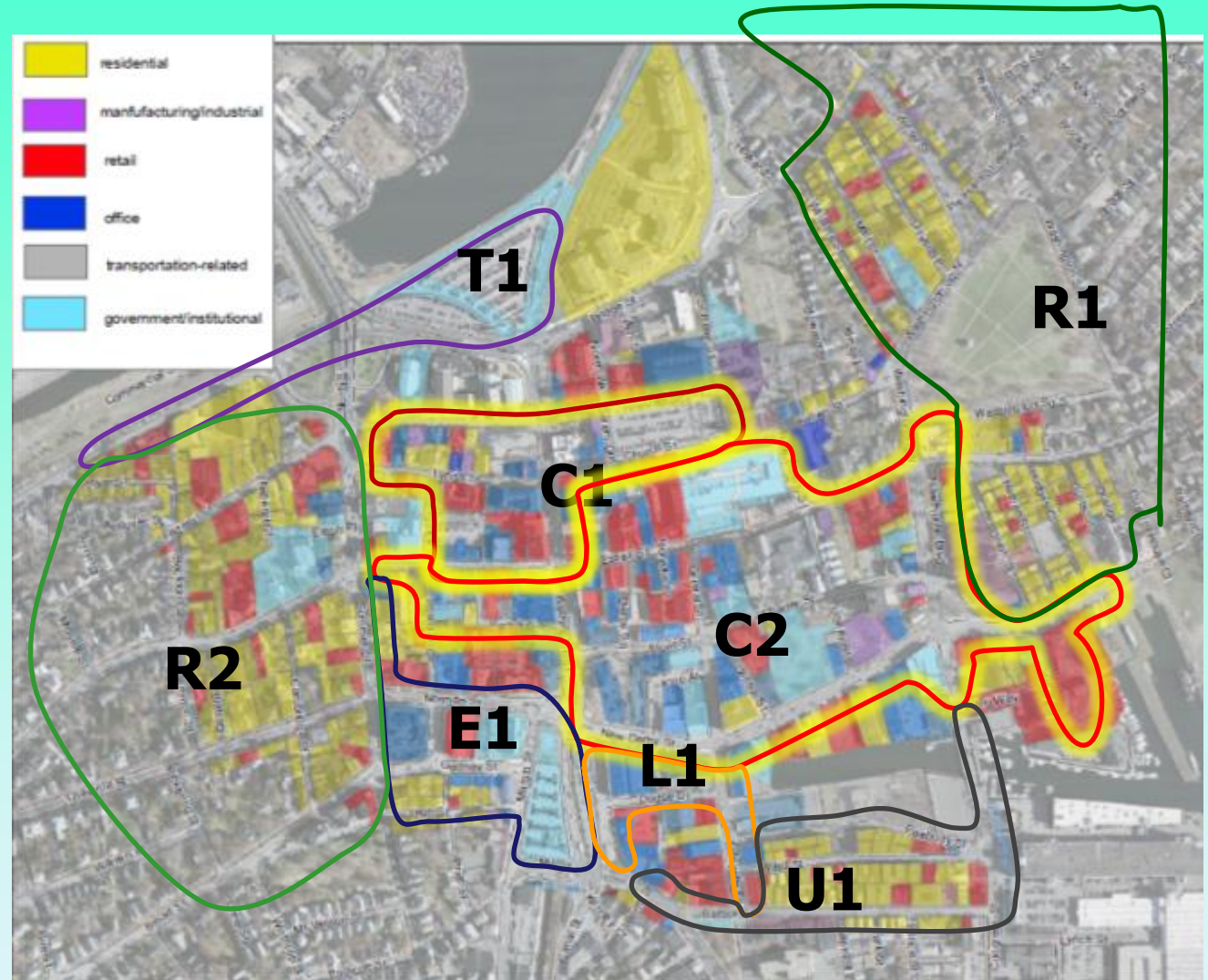


**WEEKDAY
EVENING
UTILIZATION**

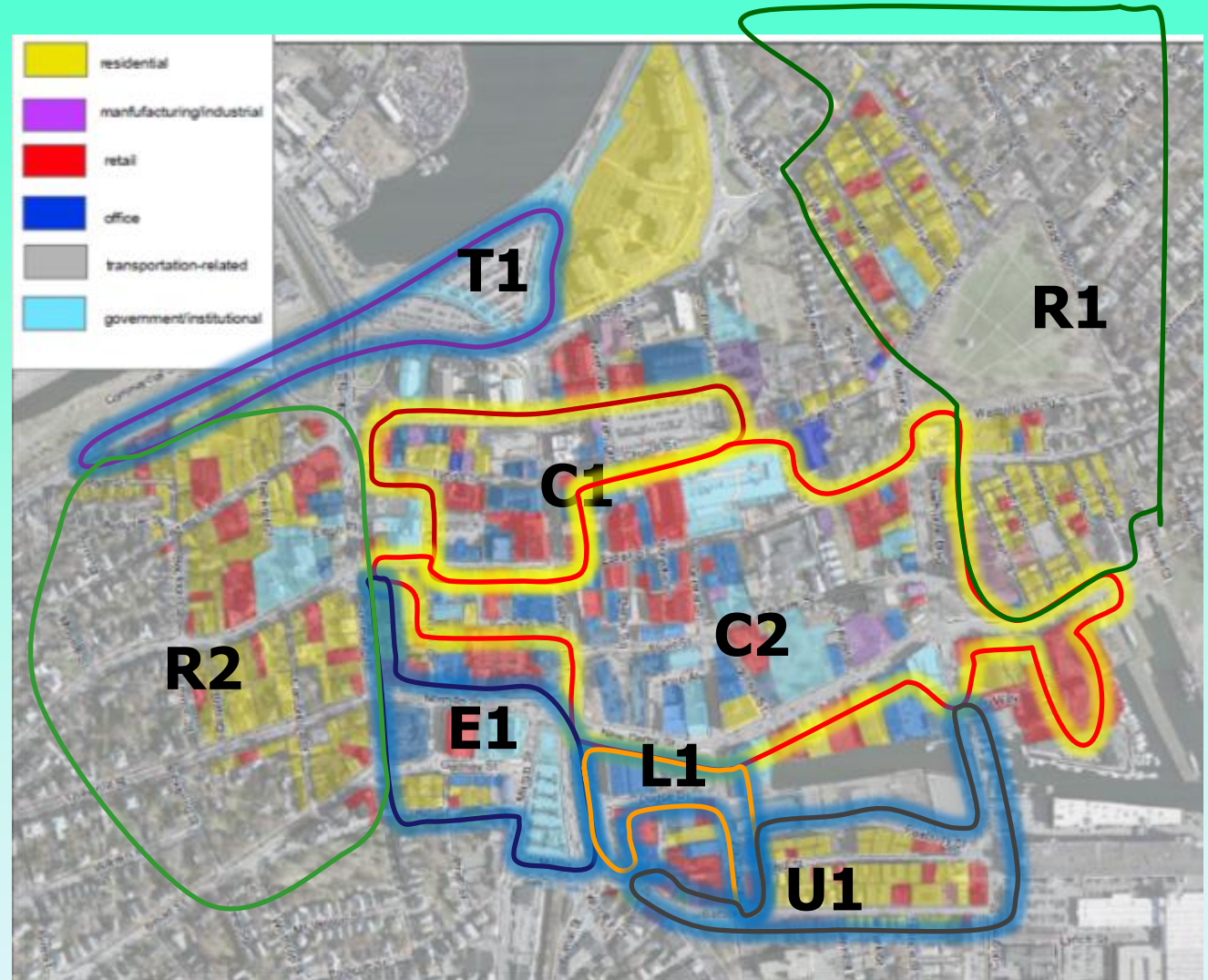
Land Uses



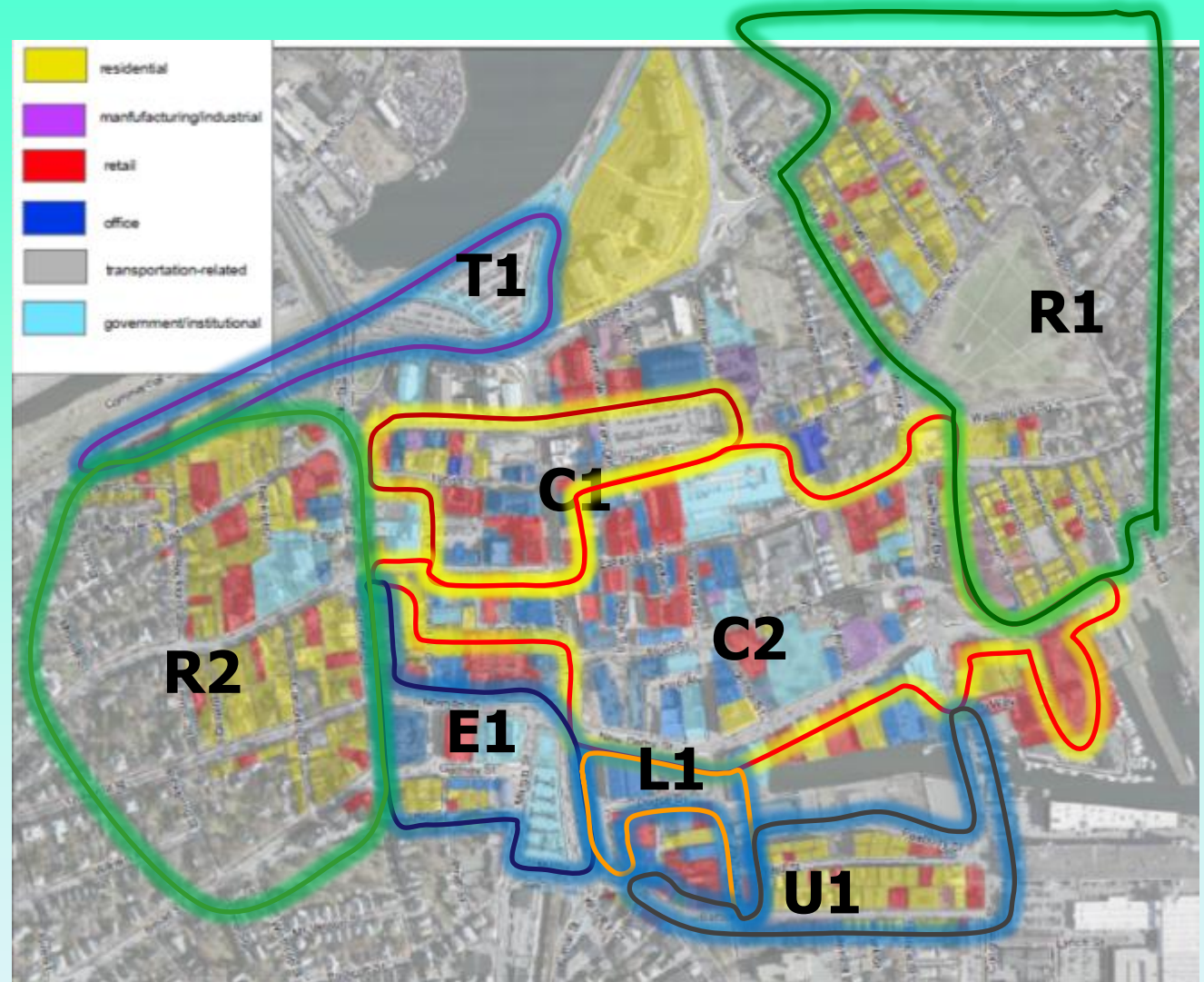
Land Uses



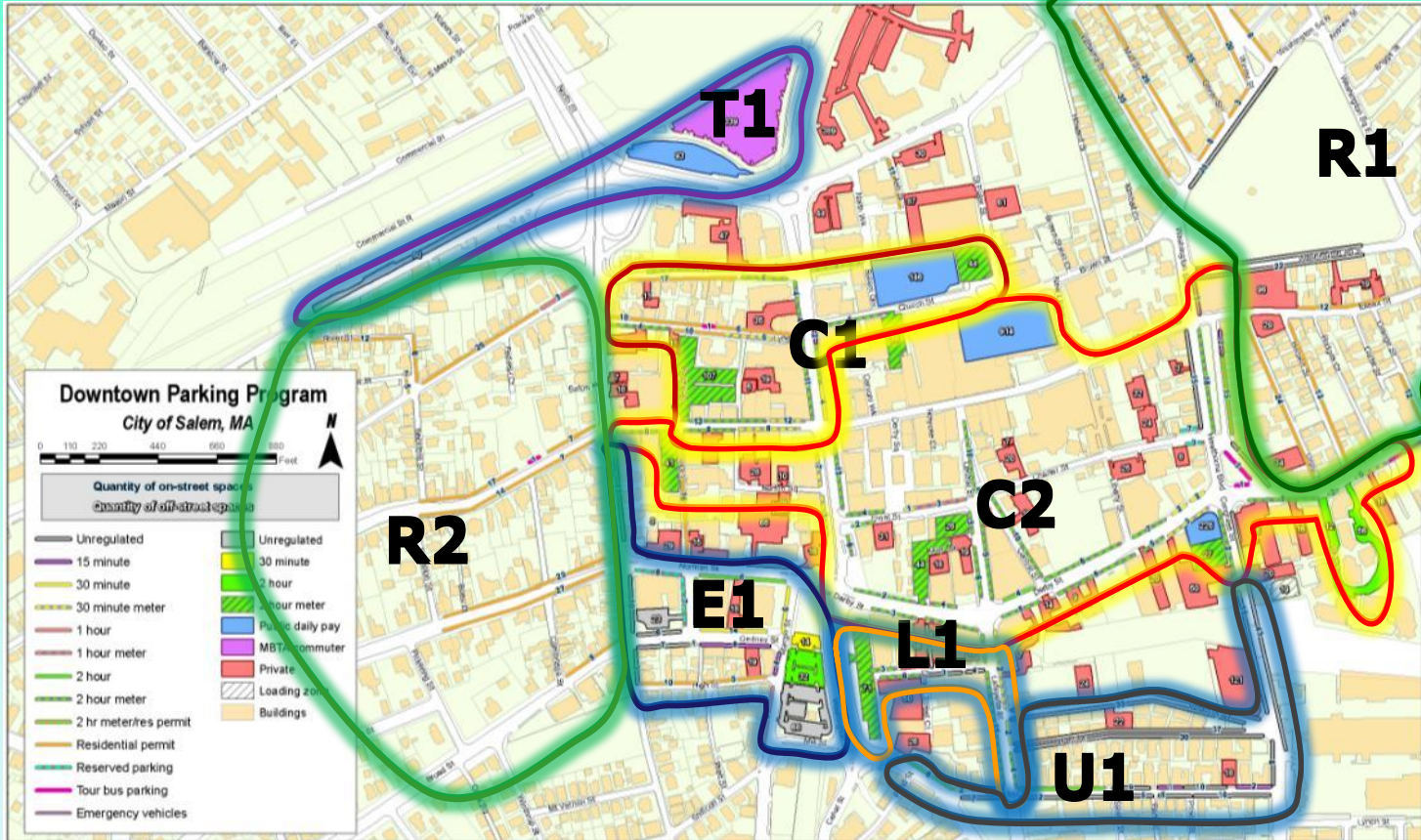
Land Uses

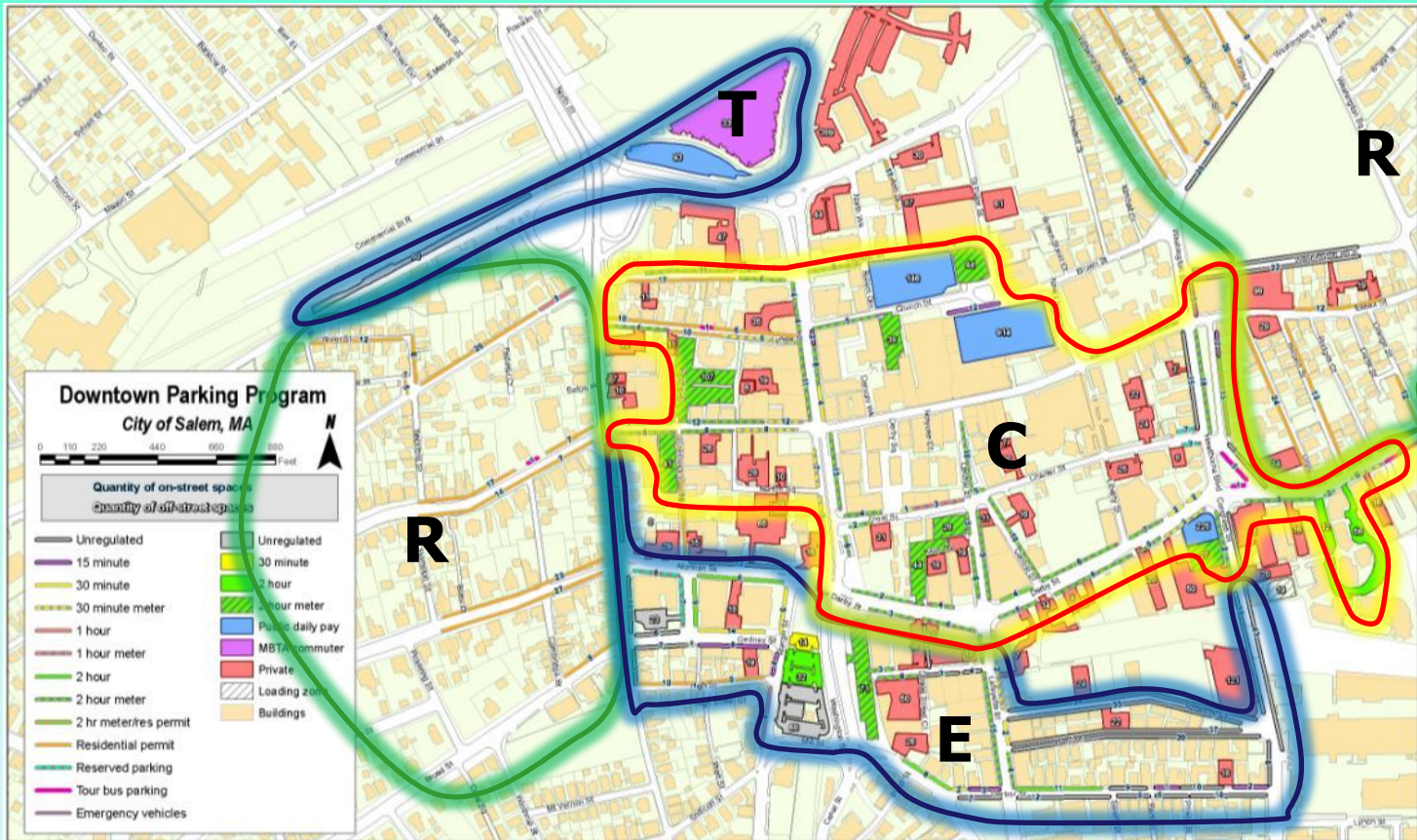


Land Uses

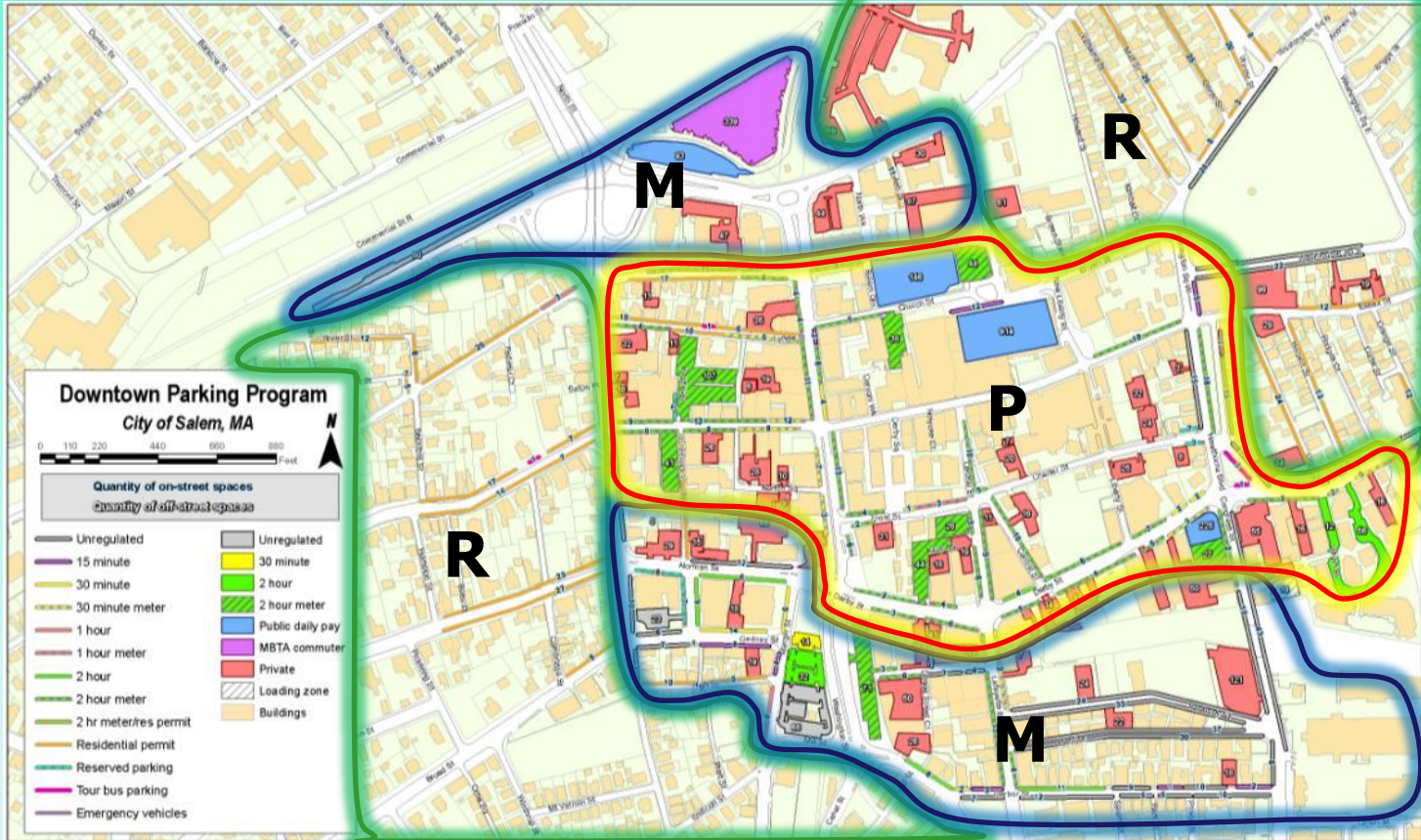


Regulations





Regulations

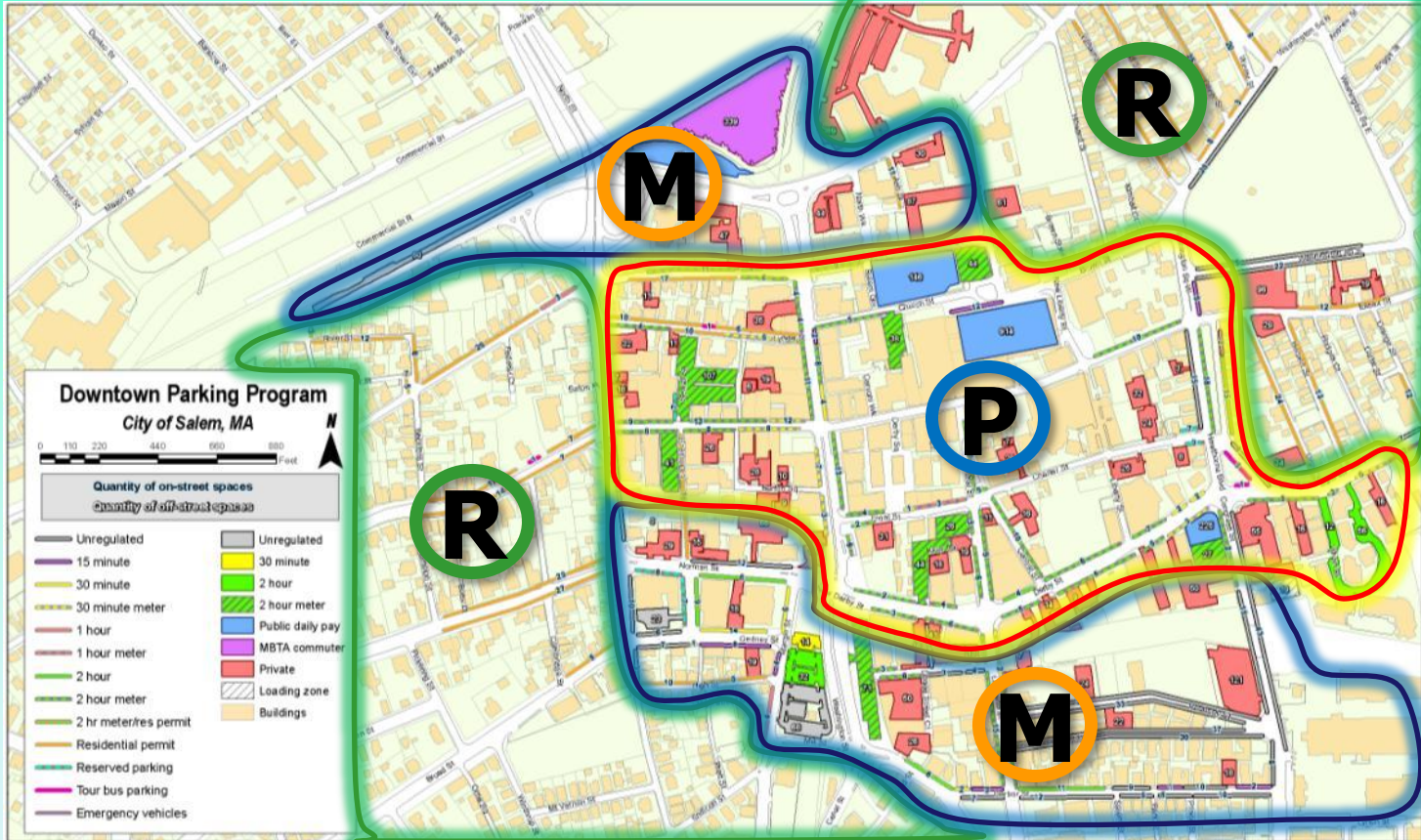


Simplifying Regulations

- P – Public Parking
- M – Monthly Permit
- R – Resident Permit



New Regulations



Key Regulatory Strategies

- Eliminate ALL time limits
 - Use pricing to force turn-over
- Vary pricing by block to encourage enough turn-over to keep all blocks 10-15% free
 - Parking can be free at times of low demand
 - Monitor and adjust rates at least quarterly
- On-street parking is more valuable than garages – price it accordingly
- Extend meter hours through dining hours (at least 10pm)
- Dedicate surplus revenues to the district (next session)

Questions? Ideas? Discussion?





Session 6

COMMUNITY BENEFITS

PARKING BENEFIT DISTRICTS

Pasadena CA – Case Study

**Putting on-street
value to use**



Old Pasadena in 1978

“The area’s been going downhill for years.”

“It’s a bunch of dirty old buildings.”

“It’s filthy.”

“It’s Pasadena’s sick child.”

“The area is unsafe.”





A NEW OLD PASADENA COMING SOON

STREET AND ALLEY WAY IMPROVEMENTS:

LIGHTING

REPAVING

TRASH RECEPTACLES

SIGNS AND BENCHES

DIRECTORY MAPS

TREES AND GRATES

NEWSRACKS

MAINTENANCE

SAFETY

**YOUR METER MONEY IS
MAKING A DIFFERENCE**

THE OLD PASADENA RENAISSANCE CONTINUES

CITY OF PASADENA









Old Town Pasadena Parking Benefit District

- ❖ Meters installed in 1993: \$1/hour
- ❖ Revenue today (including parking garages): \$5.4 million annually
- ❖ Funds garages, street furniture, trees, lighting, marketing, mounted police, daily street sweeping & steam cleaning



**Old Pasadena, 1992-99:
*Sales Tax Revenues
Quadruple***

Setting rates and spending the revenue

Revenue in 2001:

- ❖ 690 parking meters yielded \$1.3 million
- ❖ \$1867 per meter
- ❖ \$2096 per meter total, with valet parking rents and interest earnings

Expenses in 2001:

- ❖ Operating: \$235 per meter
- ❖ Capital: \$148 per meter
- ❖ Total: \$383 per meter (18% of revenue)

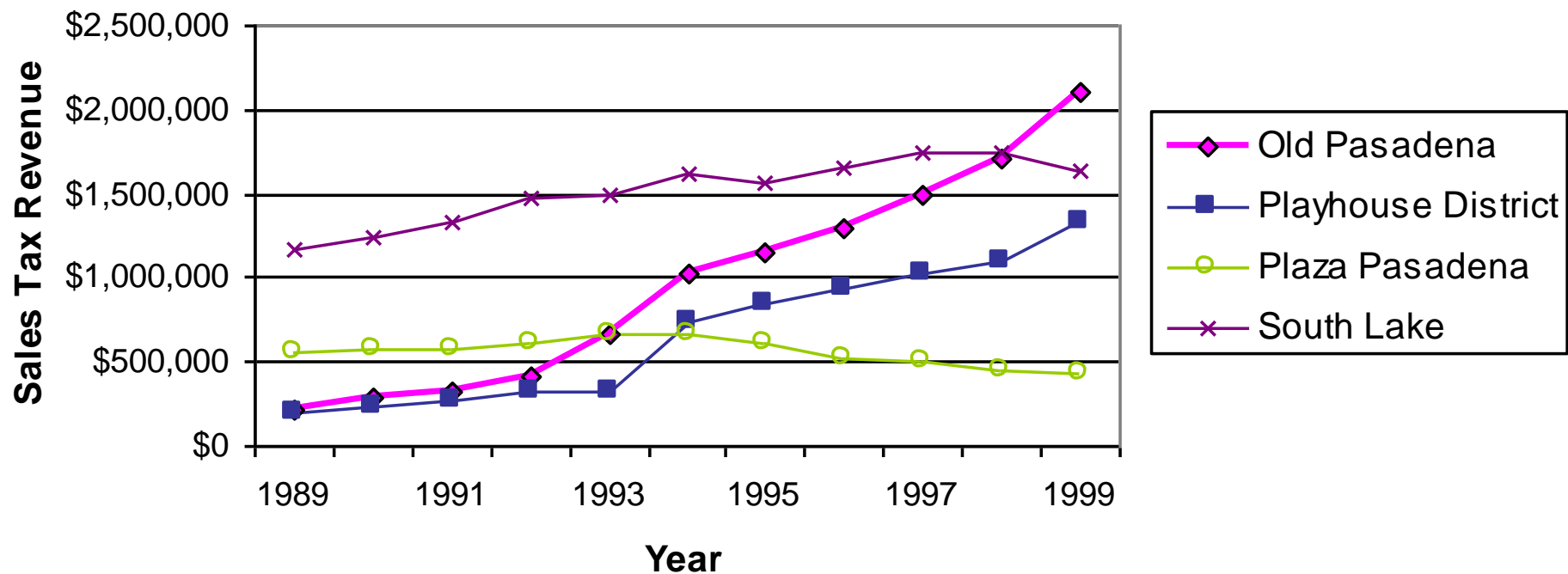
Net parking revenue:

- ❖ \$1712 per meter



The meters yield about \$50 per front foot per year

Pasadena Retail Sales Tax Revenue



Downtown Opportunities – Ped Amenities



Downtown Opportunities – Landscape Greening



Downtown Opportunities – Trash Collection



Lessons Learned

- Cities should dedicate parking meter revenue to the districts that produce it.
- Merchants will insist on charging market prices for curb parking.
- Meter revenues can greatly improve the public infrastructure of older areas.



Welcome Melissa Tintocalis!

TOD Without the Rails: Boulder CO



Source: Will Toor & Spenser Havlick

Tools: Transportation Improvement District

- ❖ Example: Boulder, CO, Downtown Management Commission & Central Area General Improvement District (CAGID)
- ❖ Responsibilities:
 - Parking construction and management
 - Operates full menu of demand management strategies
- ❖ District analyzes most cost-effective mix of new parking or transportation alternatives
- ❖ Cheaper to provide free transit to all downtown employees than provide them parking
- ❖ Provides buying power/negotiating strength for small businesses



“In the 1970s, downtown was dying ”

Boulder's strategies

- ❖ No nonresidential parking requirements in CAGID area
- ❖ Public garages – 84% funded by parking fees, 16% by taxes
- ❖ Parking benefit district: \$1 million per year in meter revenue kept
- ❖ Employee benefits: free universal transit pass(Eco-Pass); Guaranteed Ride Home; ride-matching services; bicycle parking, etc.
- ❖ \$325,000/year TDM budget
- ❖ Carpooling: 35% in 1993 to 47% in 1997
- ❖ Eco-pass: reduces commuter parking demand by 850 spaces



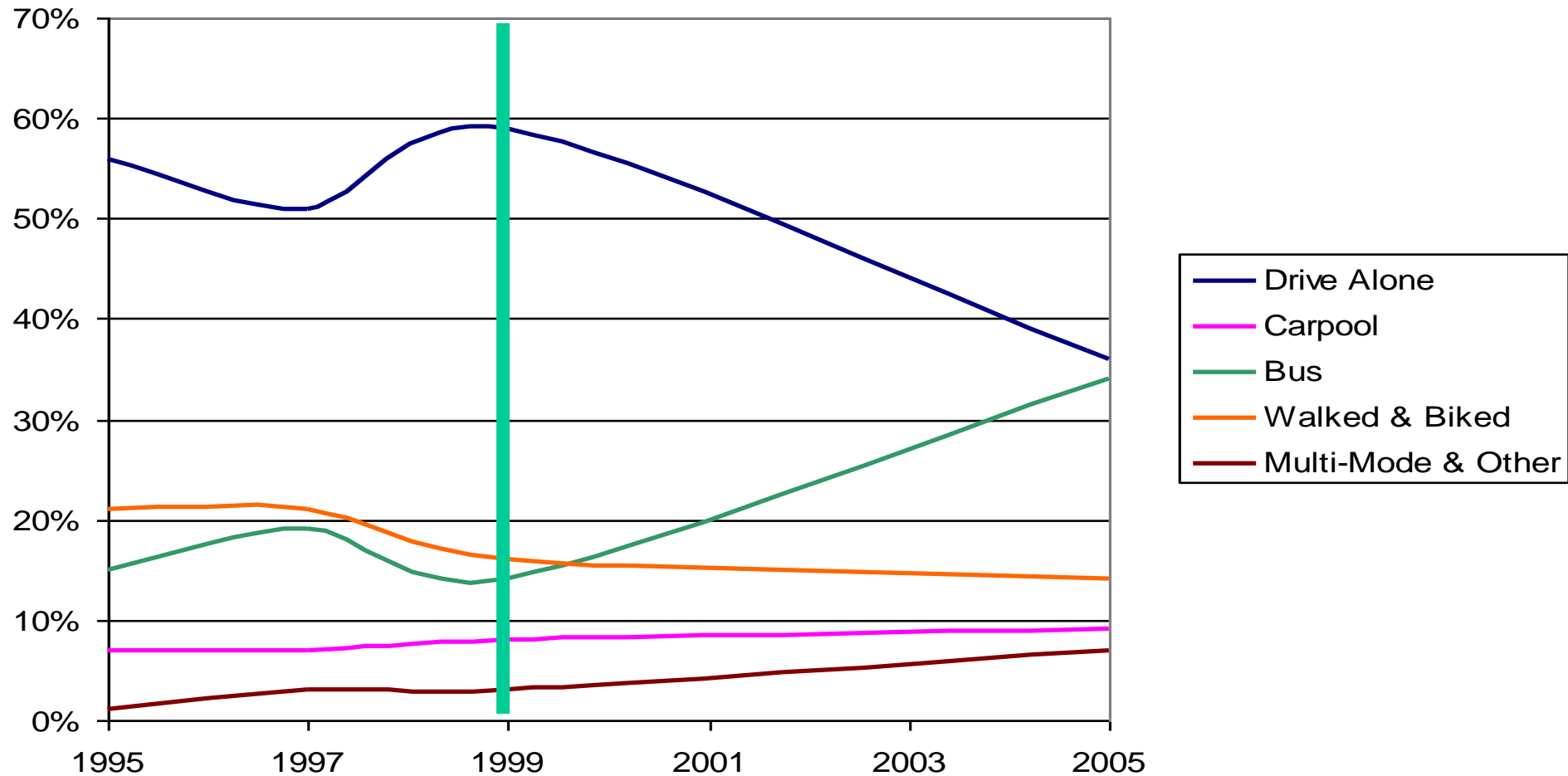
Multi-Use Path System



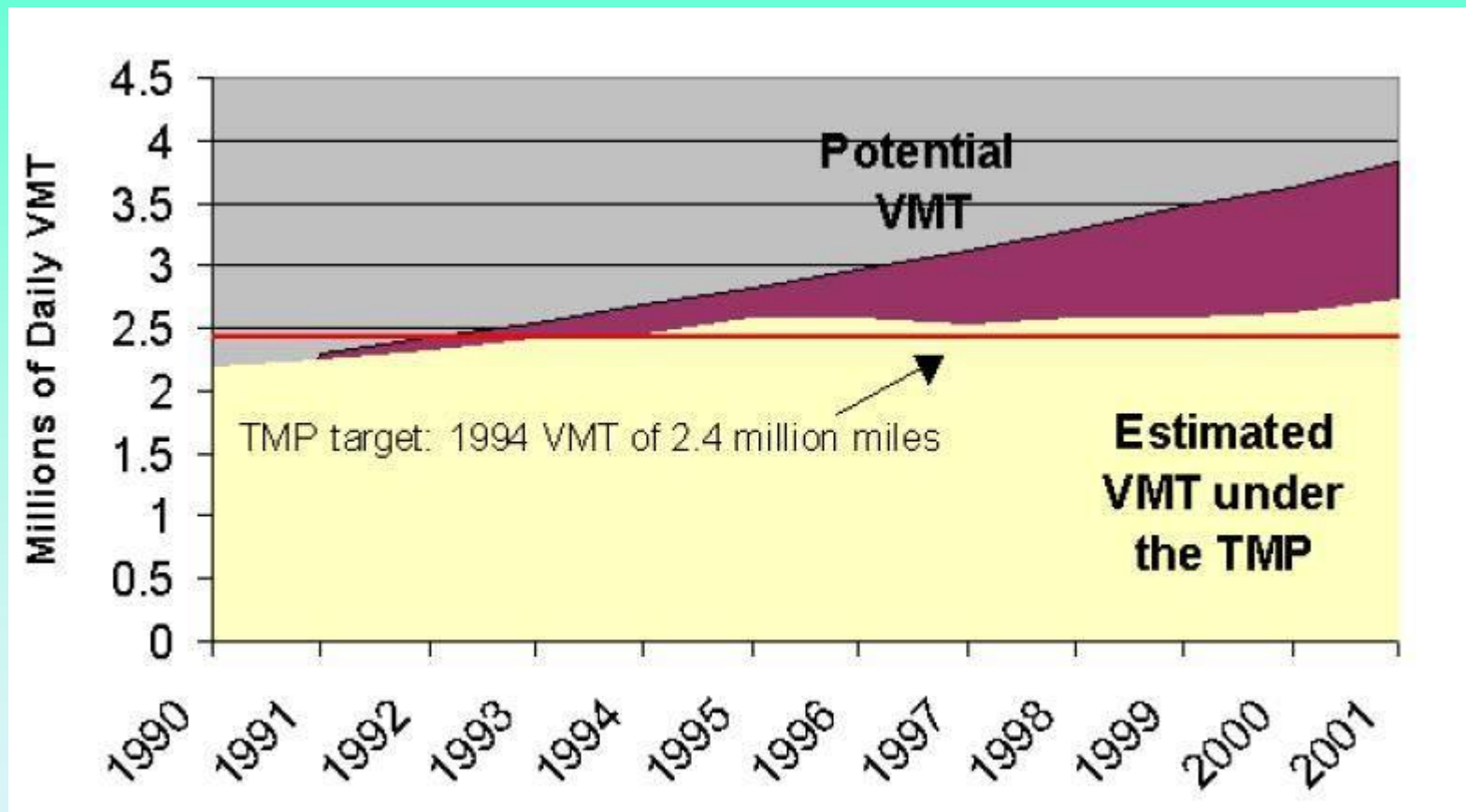
A New Bike Culture



Measurable Results



Reduced Vehicle Miles Traveled



Parking benefit districts

Commercial:

- Pasadena, CA
- San Diego, CA
- Redwood City, CA
- Seattle, WA
- Washington, DC

Commercial & Residential:

- Aspen, CO
- Boulder, CO
- Santa Cruz, CA
- Tucson, AZ
- West Hollywood, CA
- Austin, TX

THE LAW

MA Law

- Can we charge more at meters than the cost to operate and maintain parking?
 - *Yes.*
 - **Section 22A of Massachusetts State By-Law Chapter 40:**
Meter fees “shall be established and charged at such rates that the revenue therefrom shall not exceed in the aggregate the necessary expenses incurred by such city or town for the acquisition, installation, maintenance and operation of parking meters and the regulation of parking and other traffic activities incident thereto”
- What can we use the fees for?
 - *Although not tested yet in case law, theoretically any traffic-related purpose, including activities that influence the demand for parking, not simply the accommodation of it.*

MA Law

- Can funds be delegated to Business Improvement Districts?
 - *Yes.*
 - Under Massachusetts law, cities and towns may appropriate a portion of the revenue collected from parking meters to entities representing neighborhoods and districts, such as a Business Improvement District (BID), for the purpose of parking- and traffic-related improvements, maintenance and projects.
- What about Parking Benefit Districts?
 - *Not Prohibited.*
 - Current Massachusetts law does not explicitly allow for the creation of these districts.

How To...

- Three organizational approaches to managing parking to achieve community benefits:
 - Through an existing municipal department
 - Through a Business Improvement District
 - Through a Parking Authority

Existing Municipal Department

- Seek to guarantee parking revenue is used in the district in which it is created by:
 - Money in = Money Out

Existing Municipal Department

Pros

- No effort required to create a new entity
- Increased potential to coordinate efforts with other town initiatives (i.e. zoning ordinances, security, enforcement, etc).
- Highest degree of transparency

Cons

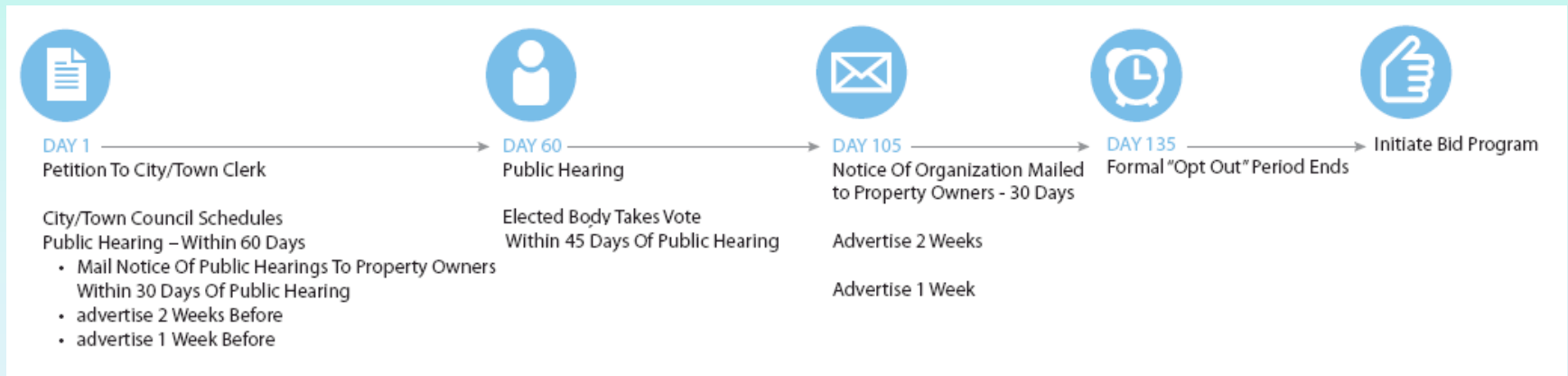
- Less focus – cities have diverse and shifting priorities
- Cumbersome – lengthy procurement processes, public decision making, etc
- Funding – Parking revenue may not be dedicated to the desired uses

BID Legislative Authorization Process

- Special Assessment District in which property owners vote to initiate, manage, and finance supplemental services
- Eligible Activities:
 - District Management – management entity with staff
 - Maintenance – street cleaning, snow removal, litter & graffiti removal, washing sidewalks, tourist guides
 - Promotion and Marketing – identification of market niche, special events, brochures, advertising, newsletters
 - Business Services – business recruitment and retention, sign & façade programs
 - Capital/Physical Improvements – streetscape improvements, management of parking garage, maintaining parking shelters, historic preservation

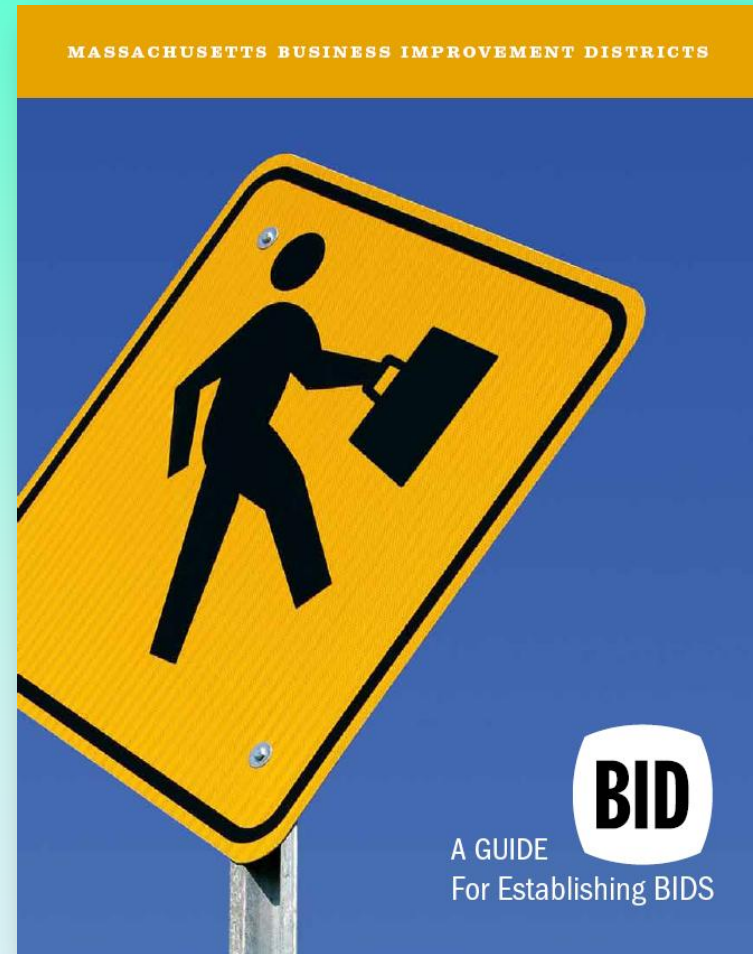
BID Legislative Authorization Process

- **Multi-year approval process:**
 - **Planning process takes between 10 – 20 months**
 - **Approval process takes up to 18 months**



Guidance on Starting a BID

- Massachusetts Department of Housing and Economic Development Website



Business Improvement District

Pros

- Increased control over revenue
- Higher degree of transparency
- Track record of success

Cons

- BID Petition Approval – requires 60 voter percent approval + public hearing
- Lengthy Process – multiple step process will require dedicated leadership
- Disorganization – under participation and inconsistent leadership may occur over time

Parking Authority

- Springfield Case:

- Established in 1981 by legislative approval
 - A body politic: a corporate and political subdivision of the commonwealth
 - Not subject to supervision or regulation by any agency of the commonwealth beyond regulation provided in legislation
 - 5-person board appointed by Mayor
 - PA can bond against parking revenue (hasn't exercised bonding power in over a decade)
- Objective: keep parking costs low by eliminating profit from public parking facilities (compete against private parking properties).

Parking Authority (Cont')

- Various studies (Parking Study, ULI Panel review) identified deficiencies in parking managed by SPA.
 - Poor maintenance of SPA facilities
 - Under utilization of facilities
 - Broken/damaged equipment
- Springfield Parking Study recommended selling several garages and outsourcing much of the PA's O&M.
- Management of On-street parking in Springfield is new as of 2008
- Revenue not used for community benefits.
- Springfield PA legislation uses identical language as the Massachusetts PA legislation (it appears that the MPA eventually became the MCCA)

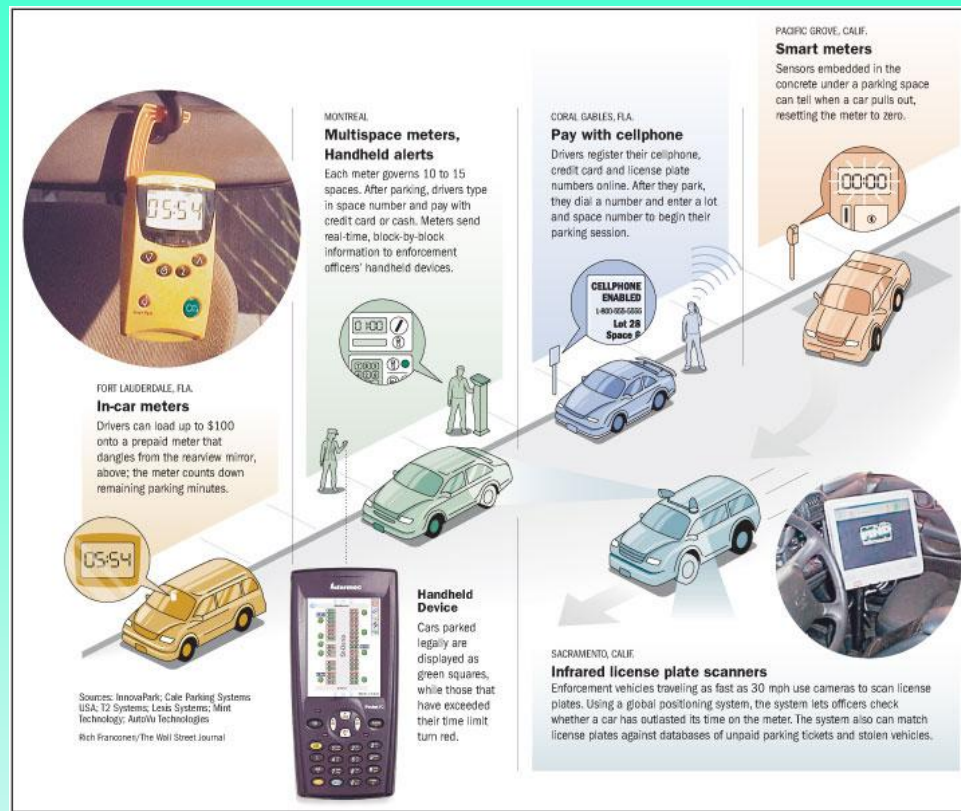
Parking Authority

Pros

- Increased autonomy
- Increased continuity – Board members are appointed for 5 year terms
- Bonding capacity – PA can bond against parking revenue

Cons

- Less transparent – Board has broad autonomy
- Political – Mayoral appointees to board
- Insular – Authorities can become self-serving without effective leadership



Session 7

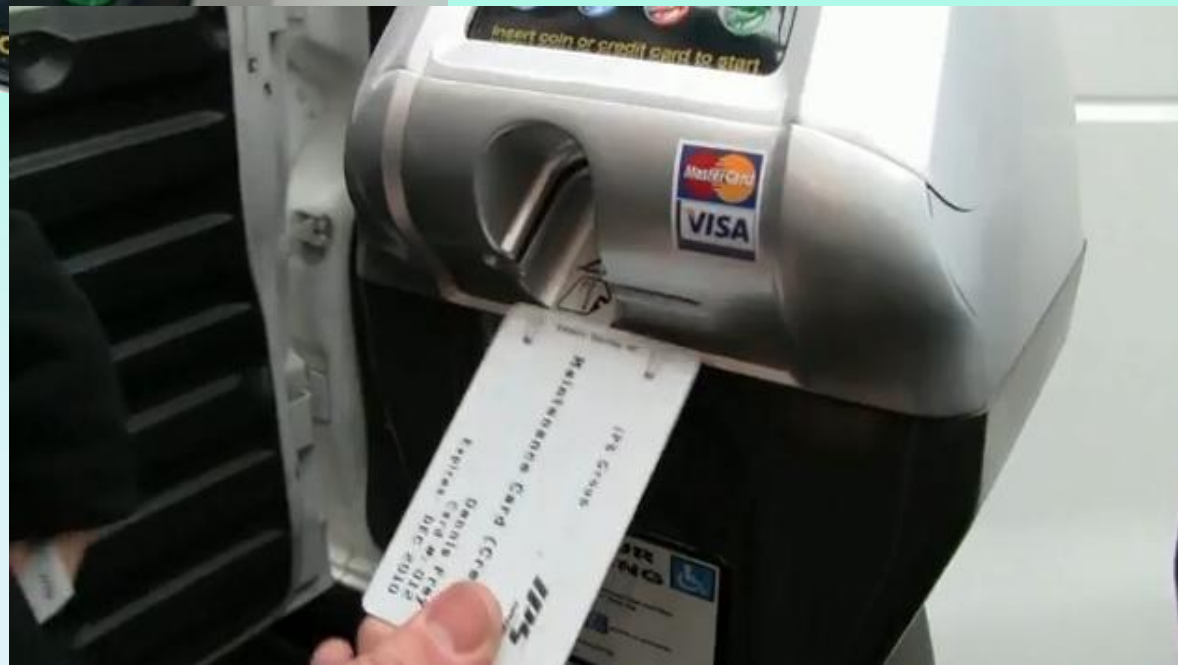
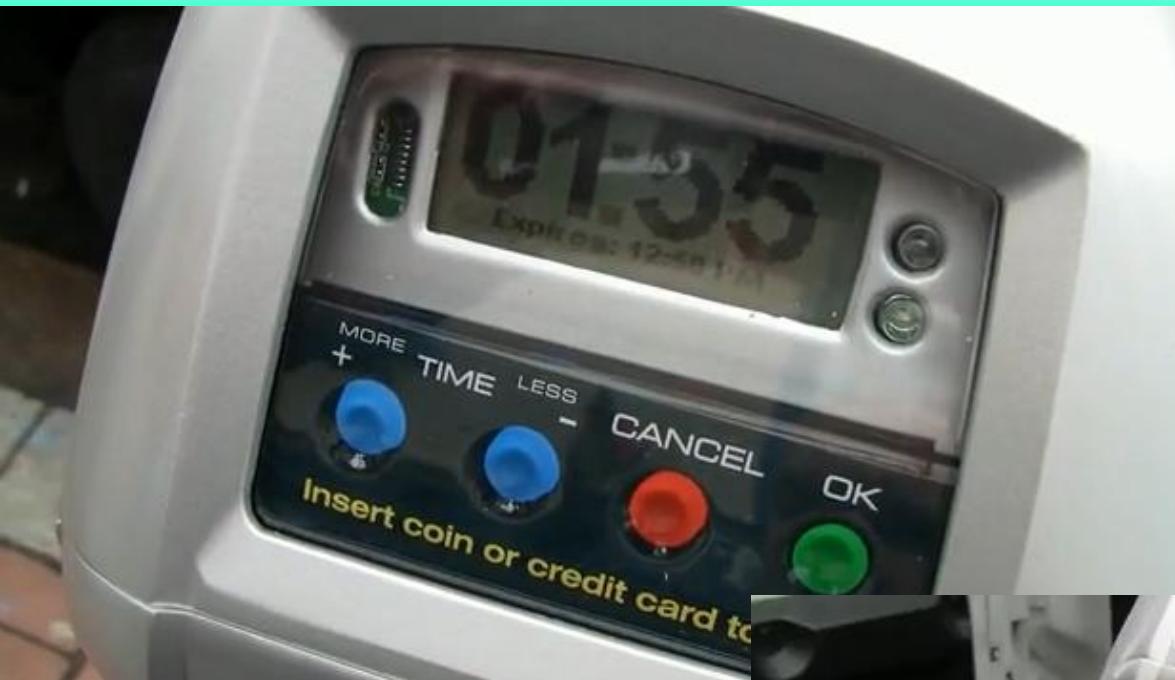
PARKING TECHNOLOGIES

Parking Technologies

- Smart meters
- Cell phone payment
- Multi-space meters
- MBTA pass integration
- Real-time space availability
- In-Car Meters



Smart Meters







Pay Stations



Source: Above images from Digital Payment Technologies, 2

Pay Stations

Pay & Display

- Advantages:
 - Visible proof of payment
 - Can apply to any configuration of parking (cram in more cars)
- Disadvantages:
 - Paper waste
 - Must return to the car
 - Must return again to add time

Pay By Space

- Advantages:
 - Only one stop at meter
 - Can integrate cell phone payment
- Disadvantages:
 - Space numbering



Redwood City, CA

Pay for Parking With Your Cell Phone!

*Use high-tech convenience
to park near your favorite shops!*



**STEP
1**

Park in an area served by
a Pay-By-Space meter
(in white below).



**STEP
2**

Note your space number.

- Curbside parking: Your number will be on the curb.
- Parking Lots: Your number will be on the asphalt behind your car.

**STEP
3**

Call our toll free
number to pay for
your parking.

1-866-283-8397

- First-time callers will need to set up an account, which takes just a few minutes.
- A service charge of \$0.35 will be added to all pay-by-phone transactions.

**STEP
4**

You're done.
Go have fun
in Downtown!



PRINT RECEIPTS ONLINE
www.verrus.com

EXPIRED

▼ **PAY BY PHONE & GO! 1-866-490-PARK** ▼
(7275)



HOURS OF OPERATION
**9AM-MIDNIGHT
EVERYDAY**

Meter ID
904

MBTA Pass Integration

- Next generation Charlie Card



Real-Time Space Availability

- Simple integration with existing control arm equipment
- LEDs have revolutionized pricing



In-Car Meters



Back-in/Head-out Reverse Angle Parking

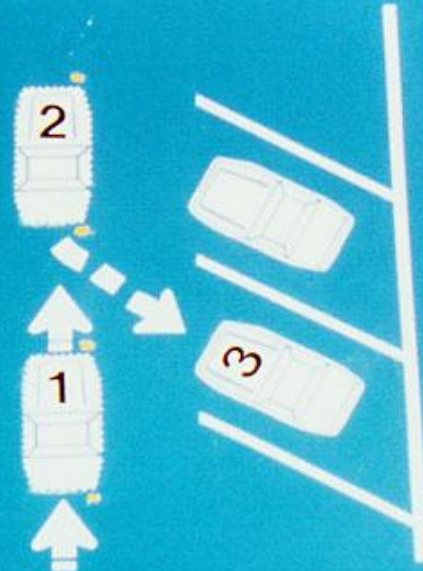






BACK-IN ANGLE PARKING

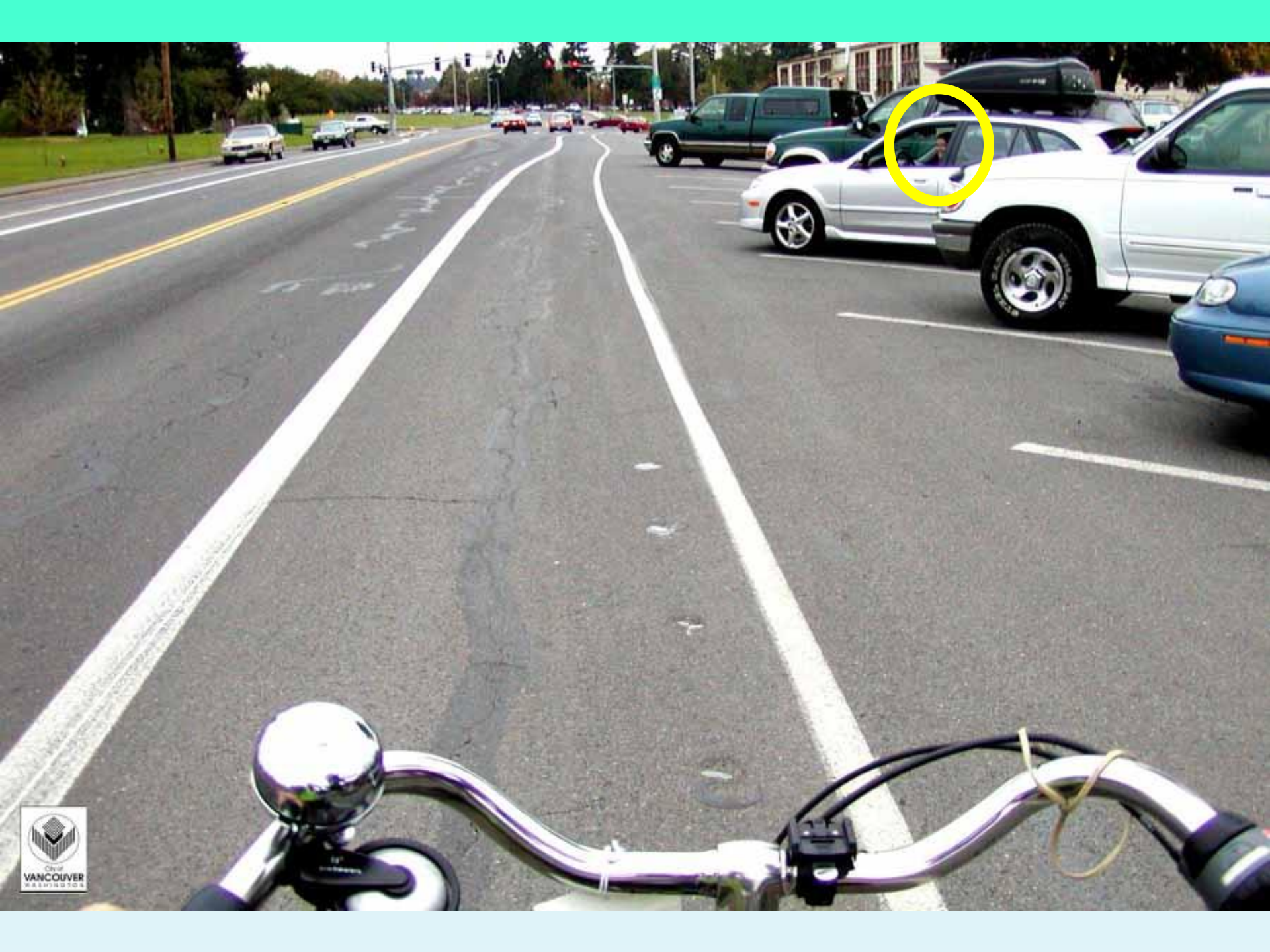
IT'S AS
EASY AS
1-2-3



1. SIGNAL
2. STOP
3. REVERSE









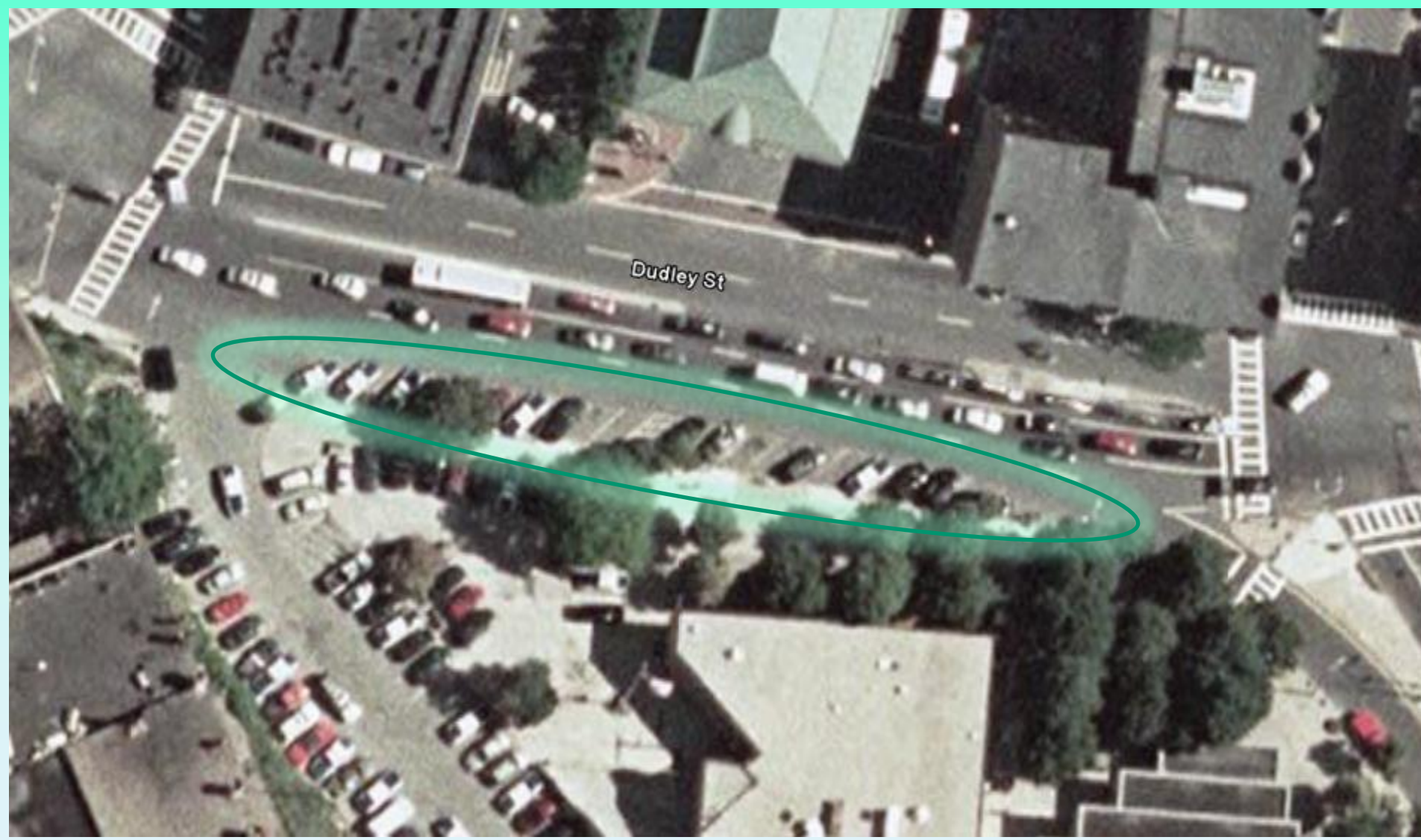
RAP: Benefits

- Driver:
 - Easier than parallel parking
 - No blind reversing into traffic
 - You can see the oncoming cars/bikes
- Passengers:
 - Open doors direct kids to the curb
 - Loading the trunk is easy
- Bicyclists:
 - Drivers see you. No random pulling into traffic.

RAP: Where is it being used?

- Seattle, WA
(30 yrs.)
- New York, NY
- Arlington, VA
- Birmingham, AL
- Charlotte, NC
- Chico, CA
- Everett, WA
- Honolulu, HI
- Indianapolis, IN
(15 yrs.)
- Pottstown, PA
- Montreal
- Olympia, WA
- Plattsburgh, NY
- Portland, OR
- Salem, OR
- Salt Lake City, UT
- San Francisco, CA
- Tacoma, WA
- Tucson, AZ
- Ventura, CA
- Washinton, DC
(20 yrs.)
- Wilmington, DE
(50 yrs.)
- Knoxville, TN
- Marquette, MI
- Boston, MA

Local Example: Boston Police, Dudley Square

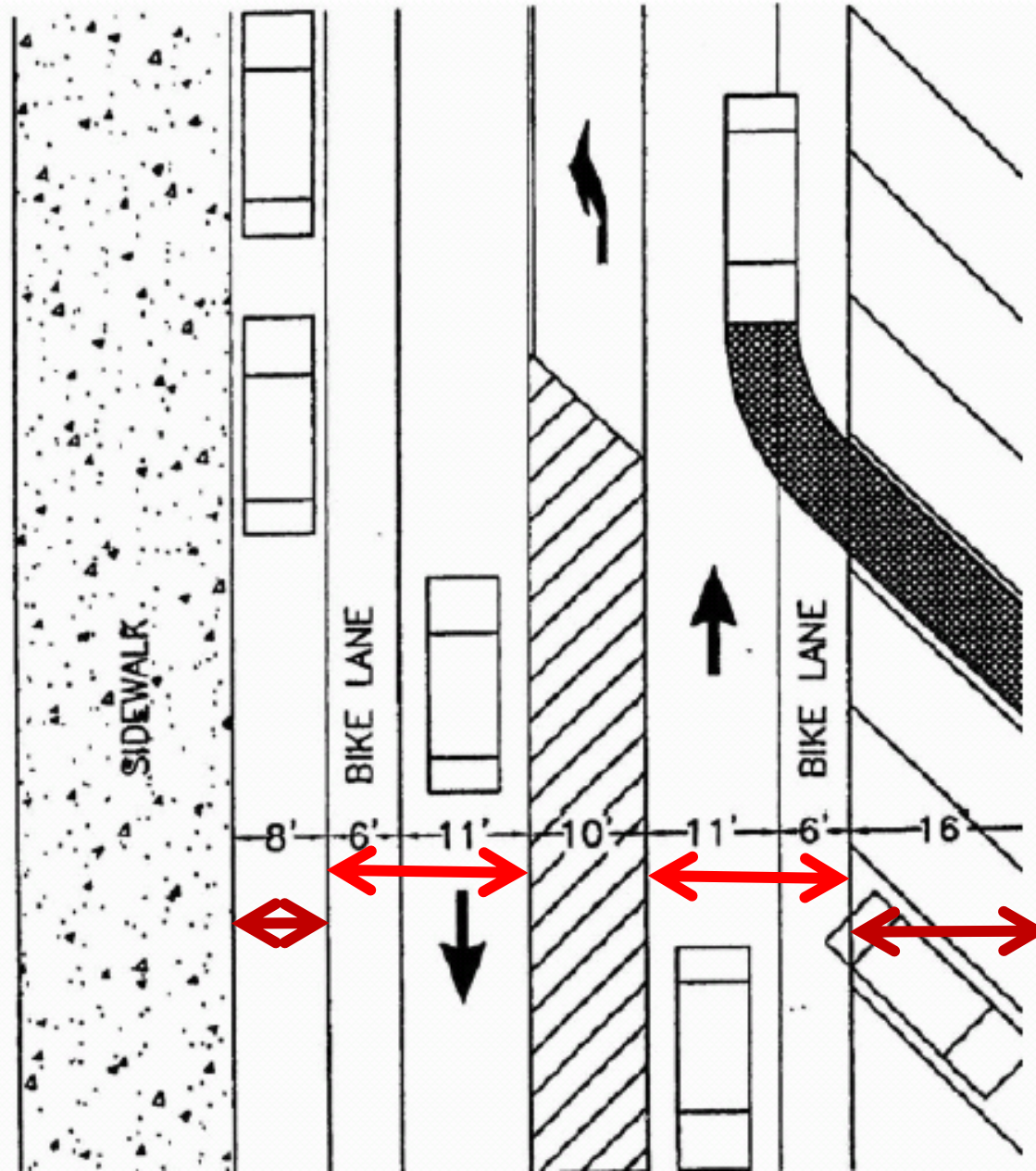


RAP: Dimensional Constraints?

- **Dimensional constraints** are constraints that involve the dimensions of the objects in the scene. For example, a constraint that states that the width of an object must be greater than the height of another object.
- Dimensional constraints are often used to model physical constraints in the world, such as the fact that a car cannot fit through a narrow doorway.
- Dimensional constraints can be used to model a wide variety of physical constraints, including constraints on the size, shape, and orientation of objects.
- Dimensional constraints can be used to model constraints on the movement of objects, such as the fact that an object cannot move through a wall.
- Dimensional constraints can be used to model constraints on the relationships between objects, such as the fact that a car must be in front of a driver.
- Dimensional constraints can be used to model constraints on the state of the world, such as the fact that a door must be closed.
- Dimensional constraints can be used to model constraints on the actions that can be performed in the world, such as the fact that a car cannot be driven through a wall.
- Dimensional constraints can be used to model constraints on the planning process, such as the fact that a car cannot be driven through a wall.
- Dimensional constraints can be used to model constraints on the representation of the world, such as the fact that a car cannot be represented as a point.
- Dimensional constraints can be used to model constraints on the reasoning process, such as the fact that a car cannot be driven through a wall.

Figure 8

Cross-section of a roadway accommodating both bike lanes and back-in/head-out angle parking.



Source: City of Pottstown (2001) Proposed High Street Traffic Calming Plan.

RAP

Expanding On-Street Supply

- Free traffic calming

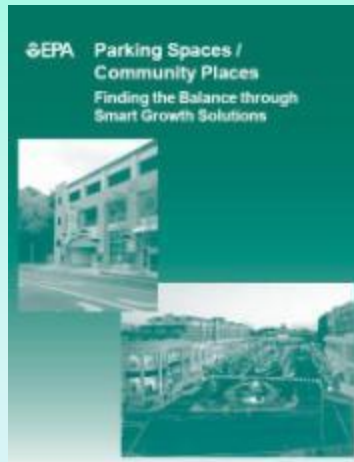


To Wrap:

- Parking demand is subject to too many variables to be predicted, so you cannot accurately project needed supply
- Zoning is the worst tool to use to project supply of a highly-valuable commodity, resulting in big battles, arbitrary waivers, and in-lieu payments
- Instead, control the externality zoning was intended to control – spill-over parking – by managing your streets
- Don't fear the developer. Go get your own comps.
- Involve the community. Be transparent with your revenues. Invest in the places where you charge to park.
- Use cool technology – customers like it

Parking Resources

- “The High Cost of Free Parking”
- By Don Shoup, UCLA
- \$60 from APA
- ❖ “Parking Spaces / Community Places”
- ❖ Free from US EPA
- ❖ “Parking Management”
- ❖ By Todd Litman
- ❖ Available at APA Bookstore or Amazon



Questions? Ideas? Discussion?



For More Information

See:

transtoolkit.mapc.org/Parking/index.htm

www.parkingreform.org

www.mass.gov/envir/smart_growth_toolkit/

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